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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to define the requirements for Robinson Brothers Construction, Inc. employees and subcontractors to safely operate an aerial lift device. An aerial lift device is defined as any device, vehicle mounted or manually propelled, telescoping or articulating, or both, which is used to position personnel above six feet in height.

1.1 Scope

This policy shall cover all aerial lift devices used on Robinson Brothers Construction, Inc. property. All employees shall operate these devices in accordance with this policy.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Handhold (Handgrip)	A handhold is a device attached to the belt which can be grasped by the passenger to provide a means of maintaining balance.
Open type	One which has a handgrip surface fully exposed and capable of being encircled by the passenger's fingers.
Closed type	A cup-shaped device, open at the top in the direction of travel of the step for which it is to be used, and closed at the bottom, into which the passenger may place his fingers.
Limit switch	A device, the purpose of which is to cut off the power to the motor and apply the brake to stop the carrier in the event that a loaded step passes the terminal landing.
Man-lift	A device consisting of a power-driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.
Rated speed	Rated speed is the speed for which the device is designed and installed.
Split-rail switch	An electric limit switch operated mechanically by the rollers on the man-lift steps. It consists of an additional hinged or "split" rail, mounted on the regular guide rail, over which the step rollers pass. It is spring loaded in the "split" position. If the step supports no load, the rollers will "bump" over the switch; if a loaded step should pass over the section, the split rail will be forced straight, tripping the switch and opening the electrical circuit.
Step (platform)	A step is a passenger carrying unit.
Travel	The travel is the distance between the centers of the top and bottom pulleys.

2.1 Key Responsibilities

2.1.1 Supervisors

- Shall ensure that all aerial devices are properly operated by trained personnel.
- Shall ensure that aerial lift devices are designed and constructed in conformance with applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms" ANSI A92.2--1969, including appendix.

2.1.2 Employees

Shall follow all aspects of this program.

3.0 SAFETY

3.1 Safe Work Practices

Make sure that workers who operate aerial lifts are properly trained in the safe use of the equipment.

- Maintain and operate elevating work platforms according to the manufacturer's instructions.
- Never override hydraulic, mechanical, or electrical safety devices.
- Never move the equipment with workers in an elevated platform unless this is permitted by the manufacturer.
- Do not allow workers to position themselves between overhead hazards, such as joists and beams, and the rails of the basket. Movement of the lift could crush the worker(s).
- Maintain a minimum clearance of at least 10 feet, or 3 meters, away from the nearest energized overhead lines.
- Always treat power lines, wires and other conductors as energized, even if they are down or appear to be insulated.
- Use a body harness or restraining belt with a lanyard attached to the boom or basket to prevent the worker(s) from being ejected or pulled from the basket.
- Set the brakes and use wheel chocks when on an incline.
- Use outriggers, if provided.
- Do not exceed the load limits of the equipment. Allow for the combined weight of the worker, tools and materials.

4.0 TRAINING

Only trained and authorized persons are allowed to operate an aerial lift. Training should include:

- Explanations of electrical, fall, and falling object hazards
- Procedures for dealing with hazards
- Recognizing and avoiding unsafe conditions in the work setting
- Instructions for correct operation of the lift (including maximum intended load and load capacity)
- Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job
- When and how to perform inspections, and

- Manufacturer's requirements.

4.1 Retraining

Workers should be retrained if any of the following conditions occur:

- An accident occurs during aerial lift use,
- Workplace hazards involving an aerial lift are discovered, or
- A different type of aerial lift is used. Employers are also required to retrain workers who they observe operating an aerial lift improperly

5.0 PROCEDURE

Aerial lifts may be "field modified" for uses other than those intended by the manufacturer provided the modification has been certified in writing by the manufacturer or by an equivalent entity.

- Lift controls shall be tested each day prior to use to determine that such controls are in safe working conditions. Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition.
- Only authorized persons shall operate an aerial lift.
- Boom and basket load limits specified by the manufacturer shall not be exceeded.
- Aerial lifts shall have a working back---up alarm audible above the surrounding noise level or the vehicle is backed up only when an observer (spotter) signals that it is safe to do so.
- The minimum clearance between electrical lines and any part of the equipment (i.e. crane or load) shall be 10 feet for lines rated 50 kV or below.
- Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.
- Approved fall protection shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.
- All employees who operate an aerial lift device shall be trained in the safe operation of the specific device they will operate. Training must conform to all OSHA requirements.

6.0 RECORDKEEPING

Training records should be maintained for at least four years. Required information includes:

- Names of employees trained, retrained and familiarized,
- Name of the trainer(s),
- Training covered,
- Date of training, and
- Written records of all inspections and repairs.

7.0 REFERENCES

1.	**Documents & External References** https://www.osha.gov/Publications/aerial_lifts_safety.html, https://safetyresourcesblog.files.wordpress.com/2014/11/aerial-and-scissors-lift-training-program.pdf, https://www.osha.gov/Publications/aerial-lifts-factsheet.pdf, OSHA Factsheet Arial Lifts

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document, if any clarification is required for changes made to previous documents,

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
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1.0 PURPOSE

The purpose of this procedure is to outline the appropriate steps in order to verify that equipment is properly grounded. This procedure specifies minimum requirements for the minimization of static electrical energy and should be used in conjunction with the Robinson Brothers Construction, Inc.'s Electrical Safety Procedures.

1.1 SCOPE

This procedure applies to all operations. It is required to provide grounding for the entire electrical system, each piece of electrical equipment, machinery, extension cords, and all portable tools. Only qualified personnel may work on exposed electrical equipment.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Bonding	The process of establishing electrical continuity between two or more conductive surfaces. Additionally, it is a process of connecting two or more conductive objects together using a conductor to minimize potential differences between conductive objects. Bonding "equalizes" the potential between objects.
Grounding	A safe pathway for electricity to follow to the ground in the event of electrical leakage in circuits and/or equipment. Also, the process of connecting one or more conductive objects to the ground. Grounding dissipates an electric charge to the
Qualified Person	One familiar with the construction and operation of the equipment and the hazards involved and are permitted to work on or near exposed energized parts.
Service Point	The point of connection between the facilities of the serving utility and the premises wiring.
Unqualified Person	One who is working in the area of equipment with exposed energized parts but is not a qualified person.

2.1 Responsibilities

2.1.1 Employer

The *OSH Act* requires employers to provide their workers with:

- A workplace that is free of serious hazards.
- The employer is also responsible for providing personal protective equipment (PPE).

- The employer shall determine, through regular supervision and inspections conducted at least on an annual basis.
- Ensure each employee is complying with the safety-related work practices required when working on or near energized or potentially energized equipment, and
- The employer shall ensure that the employee in charge conducts a job briefing with the employees involved before they start each job.

2.1.2 Site Project Manager and Supervisor

The Site Project Manager and Supervisor are to:

- Ensure that employees are in compliance with the safe work practices and the requirements in this policy plan.
- They are also responsible for performing annual review, revise the electrical safety program, and
- Ensuring training and retraining are made available to qualified and unqualified employees.

2.1.3 Employees

- Follow the safe work practices and requirements of this policy.
- Understand all procedure, standards and safe work practices that pertain to their respective job assignments.
- Ensure that they are current on training and certifications.

3.0 SAFETY

3.1 Personal Safety Measures

Hands, shoes, and clothing shall be dry when any energized electrical equipment is handled. Jewelry shall be removed before working on energized electrical equipment.

- All protective equipment shall be inspected before each job.
- Do not touch the metal frame of a case if it is ungrounded and you are in contact with the ground or a grounded object.
- Only non-conductive hard hats (ANSI Z87 Class E) are allowed for use where there is a potential for injury from electric shock or burns due to contact with energized parts.
- Only insulated tools or handling equipment shall be used when working near energized equipment if the tools or equipment might come in contact with the parts.
- The insulating materials of the tools shall be protected against damage and rated for the voltage that may be encountered

4.0 TRAINING

4.1 Initial Training

Training shall be conducted before job assignment. Robinson Brothers Construction, Inc. shall provide training to ensure that the grounding requirements, purpose, function, and proper use of tools to be used in the normal function of their jobs are understood by employees and that the knowledge and skills

required for the safe application, and usage is acquired by employees. This standard practice instruction shall be provided to, and read by all employees receiving training. The training shall include, at a minimum the following:

- Grounding requirements for tools and associated site electrical equipment.
- Types of tools appropriate for use.
- Recognition of applicable electrical hazards associated with work to be completed.
- Tool selection requirements.
- Procedures for removal of an electrical tool/accessory from service.
- All other employees whose work operations are in an area where tools could present a hazard to those users will be instructed to an awareness level concerning hazards.

a. Tools identification:

Tools having identification numbers will be checked for legibility.

b. Refresher Training:

This standard practice instruction shall be provided to, and read by all employees receiving refresher training. The training content shall be identical to initial training. Refresher training will be conducted on as required basis or when the following conditions are met, whichever event occurs sooner.

c. Retraining:

Retraining shall be provided for all authorized and affected employees whenever (and before) there being a change in their job assignments, a change in the type of tools used, or when a known hazard is added to the work environment. Additional, retraining shall also be conducted whenever a periodic inspection reveals, or whenever Robinson Brothers Construction, Inc. has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of tools. The retraining shall reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

d. Certification:

Robinson Brothers Construction, Inc. shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

5.0 PROCEDURE

If an *Assured Equipment Grounding Conductor Program* (AEGCP) is used in place of *Ground-Fault Circuit Interrupters* (GFCIs) for ground-fault protection, the following minimum requirements apply, though additional tests or procedures are encouraged:

- Keep a written description of the program at the jobsite. Outline specific procedures for the required equipment inspections, tests, and test schedule, and make them available to OSHA and affected persons *upon demand.*
- Designate one or more competent persons to implement the program. OSHA defines a *competent person* as someone who is qualified to identify hazards, and be authorized to take prompt corrective measures.

- Visually inspect all cord sets, attachment caps, plugs and receptacles, and any equipment connected by cord and plug, *before use each day*. If you see any external damage, such as deformed or missing pins, damaged insulation, etc., or discover internal damage, take the equipment out of use until it is repaired.

5.1 Identification of Grounded and Grounding Conductors

5.1.1 Identification of Conductors

- A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors.
- A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

a. Polarity of connections

No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

b. Use of grounding terminals and devices

A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

5.2 Branch Circuits and Ground-Fault Protection

5.2.1 General

The employer shall use either *Ground Fault Circuit Interrupters* or an *Assured Equipment Grounding Conductor Program* to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

5.2.2 Ground-Fault Circuit Interrupters

All 120-volt, single-phase 15 and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

5.3 Continuity Test:

Perform two OSHA-required tests on all electrical equipment:

1. A continuity test, and
2. A terminal connection test.

Tests are required:

- Before first use.
- After any repairs, and before placing back in service.
- After suspected damage, and before returning to use.
- Every 3 months.

The continuity test ensures that the equipment grounding conductor is electrically continuous. Perform this test on all cord sets, receptacles that are not part of a building or structure's permanent wiring, and cord- and plug-connected equipment required to be grounded. This test can be accomplished with various test equipment.

Examples of test equipment, such as seen here below:

Voltage/Continuity Tester

Analog Multi-Meter

Digital Multi-Meter

5.4 Terminal Connection Test:

The terminal connection test ensures that the equipment grounding conductor is connected to its proper terminal at receptacles and cord plugs. Perform this test with the same equipment used in the first test, or for receptacles use as receptacle testers as shown below.

Examples of equipment to test proper wiring on receptacles, and GFCI function (device on the right) with devices shown below:

Receptacle Tester

GFCI Receptacle Testers

5.5 Outlet Devices

Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

a. Single receptacles:

A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

b. Two or more receptacles

Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table K-4.

5.5.1 Receptacles for Connection of Motors

Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord and plug connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

TABLE K-4 - Receptacle Ratings for Various Size Circuits

Receptacle Ratings for Various Size Circuits		
Circuit Rating Amperes		**Circuit Rating Amperes**
15		Not over 15
20		15 or 20
30		30
40		40 or 50
50		50

5.6 Outside Conductors and Lamps

5.6.1 600 Volts, Nominal, or Less

branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors apply to the following:

a. Conductors on poles

Conductors supported on poles shall provide a horizontal climbing space not less than the following:

- Power conductors below communication conductors-30 inches (762 mm).

b. Power conductors alone or above communication conductors:

- 300 volts or less-24 inches (610 mm), more than 300 volts-30 inches (762 mm).

c. Communication conductors below power conductors:

- With power conductors 300 volts or less-24 inches (610 mm), more than 300 volts-30 inches (762 mm).

d. Clearance from ground.

Open conductors shall conform to the following minimum clearances:

- 10 feet (3.05 m)-above finished grade, sidewalks, or from any platform or projection from which they might be reached.
- 12 feet (3.66 m) over areas subject to vehicular traffic other than truck traffic.
- 15 feet (4.57 m) over areas other than those that are subject to truck traffic.
- 18 feet (5.49 m) over public streets, alleys, roads, and driveways.

5.6.2 Clearance from Building Openings

Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

5.6.3 Clearance Over Roofs

Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface:

- Not less than 8 feet (2.44 m) vertical clearance for insulated conductors,
- Not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:
  - Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m), or
  - Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have a vertical or diagonal clearance of not less than 3 feet (914 mm), or
  - Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm), or
  - Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof, and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

5.6.4 Location of Outdoor Lamps

Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

5.7 Services and Disconnecting

The required method shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors.

The disconnecting shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

5.7.1 Simultaneous Opening of Poles

Each service disconnecting shall simultaneously disconnect all ungrounded conductors.

5.7.2 Services Over 600 Volts, Nominal

The following additional requirements apply to services over 600 volts, nominal:

- Guarding, service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

- Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

5.8 Overcurrent Protection

5.8.1 600 Volts, Nominal, or Less.

The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

a. Protection of Conductors and Equipment

Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

b. Grounded Conductors

Except for motor running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

5.9 Disconnection of Fuses and Thermal Cutouts

Except for devices provided for current-limiting on the supply side of the service disconnecting means:

- All cartridge fuses which are accessible to other than qualified persons, and
- All fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means.
- This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

5.9.1 Location in or on Premises

- Overcurrent devices shall be readily accessible.
- Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

5.9.2 Arcing or Suddenly Moving Parts

Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise be injured by their operation.

5.9.3 Circuit Breakers

Shall comply with the following:

- Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.
- Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.
- If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."
- Over 600 volts, nominal, the feeders and branch circuits over 600 volts, nominal, shall have short-circuited protection.

5.10 Grounding

This section contains grounding requirements for systems, circuits, and equipment.

5.10.1 Systems to be Grounded

The following systems which supply premises wiring shall be grounded:

a. Three-wire DC systems:

All 3-wire DC systems shall have their neutral conductor grounded.

b. Two-wire DC systems:

Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system, which complies with the following:

- AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

c. AC systems, 50 volts to 1000 volts:

AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions:

- If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts,
- If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor,
- If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor, or
- If a service conductor is uninsulated

EXCEPTIONS: If fuses and circuit breakers is located or shielded that employees will not be burned or otherwise injured by their operation. Handles or levers of circuit breakers, and similar parts that may move suddenly in such a way that persons in the vicinity are likely to be injured by being struck by them, shall be guarded or isolated.

AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

- The system is used exclusively for control circuits,
- The conditions of maintenance and supervision ensure that only qualified persons will service the installation,
- Continuity of control power is required, and
- Ground detectors are installed on the control system.

5.11 Separately Derived Systems

This section requires grounding of wiring systems whose power is derived from the generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

5.12 Portable and Vehicle-Mounted Generators

5.12.1 Portable Generators

Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

- The generator supplies only equipment mounted on the generator and/or cord and plug-connected equipment through receptacles mounted on the generator, and
- The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

5.13 Vehicle-Mounted Generators

Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

- The frame of the generator is bonded to the vehicle frame,
- The generator supplies only equipment located on the vehicle and/or cord- and plug-connected equipment through receptacles mounted on the vehicle or the generator, and
- The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of and the receptacles are bonded to the generator frame.

5.14 Neutral Conductor Bonding

A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

5.14.1 Conductors to be grounded

For AC premises wiring systems, the identified conductor shall be grounded.

5.15 Grounding Connections

5.15.1 Grounded System

For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode.

Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

5.15.2 Ungrounded Systems

For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

5.15.3 Grounding Path

The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

5.16 Supports, Enclosures, and Equipment to be Grounded

5.16.1 Supports and Enclosures for Conductors

Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

- Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded, and
- Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:
  - Runs are less than 25 feet (7.62 m),
  - Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials, and
  - Enclosures are guarded against employee contact.

5.17 Service Equipment Enclosures

Metal enclosures for service equipment shall be grounded.

5.17.1 Fixed Equipment

Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

- If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.
- If located in a wet or damp location and subject to employee contact.
- If in electrical contact with metal.
- If in a hazardous (classified) location.
- If equipment operates with any terminal at over 150 volts to ground. However, the following need not be grounded:
  - Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only,
  - Metal frames of electrically heated appliances which are permanently and effectively insulated from ground, and

- The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

5.18 Equipment Connected by Cord and Plug

Under any of the conditions, exposed noncurrent-carrying metal parts of cord- and plug-connected equipment which may become energized shall be grounded:

- If in a hazardous (classified) location.
- If operated at over 150 volts to ground.
- Except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.
- If the equipment is one of the types listed below, the equipment may not need to be grounded if it is exempted.

a. Hand Held Motor-Operated Tools

- Cord- and plug-connected equipment used in damp or wet locations or by employees standing on the ground or metal floors or working inside of metal tanks or boilers,
- Portable and mobile X-ray and associated equipment,
- Tools that are likely to be used in wet and/or conductive locations,
- Portable hand lamps.

Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

5.19 Nonelectrical equipment

The metal parts of the following nonelectrical equipment shall be grounded:

- Frames and tracks of electrically operated cranes,
- Frames of nonelectrically driven elevator cars to which electric conductors are attached,
- Hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over IkV between conductors.

5.20 Methods of Grounding Equipment

With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this subpart, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits, only the equipment grounding conductor may be run separately from the circuit conductors.

5.20.1 Grounding Conductor

A conductor used for grounding fixed or movable equipment shall have the capacity to conduct safely any fault current which may be imposed on it.

5.20.2 Equipment Considered Effectively Grounded

Electric equipment is considered to be effectively grounded if it is secured to and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment.

Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

5.20.3 Bonding

If bonding conductors are used to ensure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

a. Made Electrodes

- If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel, and
- If practicable, they shall be embedded below permanent moisture level.
- A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

5.21 Grounding of Systems and Circuits of 1000 volts and Over (high voltage)

If high voltage systems are grounded, they shall comply with the following conditions below:

a. The grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

- Portable and mobile high-voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.
- Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected to an equipment grounding conductor to the point at which the system neutral impedance is grounded.
- Ground-fault detection and relaying shall be provided to automatically de-energize any high voltage system component which has developed a ground fault.
- The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically.
- The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and

- There shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

5.22 Grounding of Equipment

All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded.

However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

6.0 RECORDKEEPING

Records shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the Assistant Secretary and any affected employee.

Maintain a written record of the required tests:

- Identifying all equipment that passed the test
- The last date it was tested (or the testing interval), and
- Make it available to OSHA inspectors and affected persons upon demand.

7.0 REFERENCES

1.	**Documents & External References** Model Safety Program DATE: SUBJECT: Assured Equipment. PDF, OSHA 29 CFR, Subpart S Electrical, 1910.304 Wiring design and protection, file:///F:/USRAVs%20Working/2nd%20Set/16.%20Assured%20Grounding/Research/Attach_EE_Grounding.pdf, 1926 Subpart: K Electrical 1926.404, Wiring design and protection.

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to define work practices, administrative procedures, and engineering controls to protect employees exposed to Benzene concentrations above the OSHA action level. This plan shall be implemented and kept current by the CSO as required to reflect the most recent exposure monitoring data.

1.1 SCOPE

This procedure applies to employees where exposures to Benzene can occur. This procedure applies to all Robinson Brothers Construction, Inc. employees and subcontractors. When work is performed on a non-owned or operated site, the operator's program shall take precedence.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Action Level	An airborne concentration of Benzene of 0.5 ppm calculated as an 8-hour time-weighted average.
Employee Exposure	Exposure to airborne Benzene that would occur if the employee were not using respiratory protective equipment.
Health Effects	Short-term overexposure may cause irritation of eyes, nose, and skin; breathlessness, irritability, euphoria, headache, dizziness or nausea. Long term effects may result in blood disorders such as leukemia and anemia.
Assistant Secretary	The Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.
Authorized person	Any person specifically designated by the employer, whose duties require entrance into a regulated area, or a person entering such an area as a designated representative of employees to exercise the right to observe monitoring and measuring procedures.
Director	The Director of the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.
Employee exposure	Exposure of a worker to airborne concentrations of Benzene which would occur if the employee were not using respiratory protective equipment.
Permissible Exposure Limits, PELs	Either the 8-hour Time Weighted Average (8-hour TWA) exposure or the Short Term Exposure Limit (STEL).
Regulated Area	Any area where airborne concentrations of Benzene exceed or can reasonably be expected to exceed the 8-hour time weighted average (8-hour TWA) exposure of 1 ppm or the short-term exposure limit (STEL) of 5 ppm for 15 minutes.

2.1 Responsibilities

2.1.1 Employer

Employers must establish and implement a written program to reduce employee exposure to or below the PEL using primarily the engineering and work-practice controls required:

- The written program must include a schedule for developing and implementing engineering and work-practice controls.
- The program must be reviewed and revised as appropriate based on the most recent exposure monitoring data, and reflect the current status of the program.
- Employers must obtain or develop a Safety Data Sheet (SDS), and employers must also ensure that employees have access to the Benzene SDS.

Upon request, the written program must be furnished to the Assistant Secretary (OSHA), the Director of the National Institute for Occupational Safety and Health (NIOSH), affected employees, and designated employee representatives for examination and copying.

2.1.2 Management

Management is responsible for the following:

- Ensure that the HSE Management System includes a Benzene policy and that the policy is reviewed annually and revised as necessary to reflect the most recent exposure monitoring data.
- Provide Benzene Hazard Awareness Training for all employees assigned to at-risk areas.
- Provide leadership and support for employees in communicating their responsibility to stop the work when Benzene hazards are discovered or suspected.
- Provide resources to address and correct any Benzene related events that arise.
- Determine when medical surveillance is required.
- Ensure that confirmed employee exposures are adequately documented.

2.1.3 Supervision

Supervision is responsible for the following:

- Understand and enforce the Benzene Policy.
- Implement site controls isolating employees from Benzene hazards when Benzene is discovered or suspected on a job site.
- Immediately inform management of any Benzene exposures on a job site.
- Provide immediate on-the-spot training in recognition and control of Benzene hazards for all employees assigned to at-risk locations, enabling employees to protect themselves and others from unnecessary Benzene exposure.
- Contact a competent individual when Benzene is discovered on a job site.

- Enforce Air Testing and PPE requirements and enforce discipline as necessary for PPE or any hazard control violation.

2.1.4 Employees

Employees are responsible for the following:

- Upon discovery of Benzene being present on a job site, Robinson Brothers Construction, Inc. employees are to stop the work and immediately inform their supervisor.
- Protect themselves and others from unnecessary Benzene exposure by wearing appropriate PPE and following safety rules and guidelines regarding Benzene hazard protection.
- Immediately report to a supervisor any changes, deficiency or breaches in site controls established to isolate employees from Benzene hazards on a job site.
- Participate in and understand Benzene Awareness training.
- Participate in hazard recognition activities.

3.0 SAFETY

3.1 Possible Exposure Performing Jobs

Possible locations where employees may be exposed to benzene during their job functions Some examples may include, but not limited to:

- Petroleum refining sites,
- Tank gauging (tanks at producing, pipeline & refining operations), and
- Field maintenance.

3.2 First Aid Procedures

Remove the exposed employee to an uncontaminated environment. Wash exposed skin with soapy water. Remove Benzene wetted clothing immediately. If Benzene is ingested, do not induce vomiting. Seek medical attention.

3.2.1 Additional Personal Protective Equipment (PPE)

When liquids containing Benzene are present, additional PPE, i.e., aprons, chemical suits, gloves, boots, goggles and face protection shall be used to prevent eye contact and limit dermal exposure. PPE must meet the requirements of 29 CFR 1910.133 and be provided at no cost to employees.

4.0 TRAINING

Robinson Brothers Construction, Inc. will provide Benzene hazard awareness training for all employees.

4.1.1 Training Content

Training will cover the following topics:

- Benzene Hazard Awareness Training
- Robinson Brothers Construction, Inc. Benzene Policy
- Responsibilities

- Hazard Recognition & Control
- Protection & First Aid

4.1.2 Personnel Training

Personnel shall receive the following training:

All employees shall receive Benzene Hazard Awareness training and have access to the written plans.

4.1.3 Training Frequency

Training and re-training frequency shall be as follows:

- Initial Benzene Hazard Awareness Training shall take place when employees mobilize to job-sites with known Benzene hazards.
- Benzene awareness training shall be refreshed annually as part of the Toolbox Safety Meeting Program, Industrial Hygiene & Hazard Communication agenda.

5.0 PROCEDURE

The Robinson Brothers Construction, Inc. Safety Manager or other designated person in his or her absence is assigned the responsibility for Benzene Awareness. This procedure will apply to all workplaces for all project and contract personnel at all project locations.

5.1 Exposure Hazards

Benzene is listed as a carcinogen; therefore, any exposure to Benzene should be avoided.
Benzene liquid is highly flammable, and vapors may form explosive mixtures in air. Fire extinguishers must be readily available. Smoking is prohibited in areas where Benzene is used or stored.

5.1.1 Routes of Entry

- Inhalation is the primary route of entry into the body. Exposures may occur during accidental spills and release or in/near confined spaces. These exposures typically can be experienced in operations such as sampling, liquid draining, and equipment maintenance.
- Skin Contact presents a possible route of absorption, but generally at a much lower rate than through the respiratory system. Benzene is poorly absorbed through the skin but can find its way into the blood stream through cuts, scores, etc. Benzene is a solvent and an irritant to the skin. The primary effect of skin contact is defatting, resulting in dermatitis.
- Ingestion of Benzene is a remote form of exposure and is mainly due to poor personal hygiene practices such as failure to wash hands before eating, chewing, dipping or smoking.

5.1.2 Effects of Overexposure

a. Acute:

Overexposure to high concentrations of Benzene may result in feelings of breathlessness, irritability, euphoria, or light-headiness. Irritation of the eyes, nose, and respiratory tract may be experienced. Headaches, dizziness, nausea, or intoxication may develop. Severe exposure may lead to convulsions and loss of consciousness.

b. Chronic

Repeated or prolonged exposure to Benzene, without the use of personal protective equipment, may result in various blood disorders. Anemia and leukemia, a fatal cancer of the blood, are examples of adverse effects that may result from exposure to Benzene.

5.2 First Aid Procedures

5.2.1 First Aid & Exposure Response

Provide general supportive measures (comfort, warmth, rest). Consult a physician and/or the nearest Poison Control Center for all exposures except very minor instances of inhalation or skin contact.

5.3 Physical Data

Benzene liquid is highly flammable, and vapors may form explosive mixtures in the air:

Color	Clear and colorless
Odor	Characteristic pleasant acrid odor at low concentrations; disagreeable at higher concentrations.
Odor Threshold	Greater than 4.6 PPM
Explosive Limits	1.4 - 8%
Boiling point	176 F
Specific Gravity	0.879 Floats on water
Vapor Density	2.8 Heavier than air

5.4 General Requirements

5.4.1 Exposure Limits

- *Permissible Exposure Limit* (PEL) 1.0 ppm (parts per million) averaged over 8 hours.
- *Short-Term Exposure Limit* (STEL) 5.0 ppm averaged over 15 minutes.
- *Action Level (AL)* - The exposure level at which various parts of the Benzene standard are required to be implemented, for example, medical surveillance and training. The AL is 0.5 ppm averaged over 8 hours.

5.5 Methods of Reducing Exposure

5.5.1 Engineering and Work Practices Controls

The employee should be aware of Robinson Brothers Construction, Inc. site specific contingency plan provisions. Employees must be informed where Benzene is used in host facility and aware of additional plant safety rules.

Where feasible, Benzene exposures should be controlled through engineering controls and work practices. Respirators and protective clothing should be used to control exposures that are intermittent or caused by emergency conditions and while awaiting engineering controls to be implemented.

5.6 Respiratory Protection

Respiratory Protection shall be NIOSH approved and as outlined below:

Benzene Concentration	Respirator*	Cartridge

Unknown (i.e., no air sampling information and/or emergency response for a release)	Supplied Air	Not applicable
Less than 1.0 ppm	None required	Not applicable
Greater than or equal to 1.0 ppm, but less than 10 ppm	Half-Mask Air-Purifying	Organic vapor (Black) or organic vapor / acid gas *Yellow) cartridges
Greater than or equal to 10 ppm, but less than 50 ppm	Full Face Air Purifying or Supplied Air	Organic vapor (Black) or organic vapor / acid gas *Yellow) cartridges
Equal to or above 50 ppm	Supplied Air	Not applicable

5.7 Regulated Areas

Whenever airborne concentrations of Benzene in an area or specific operation exceed or can be reasonably expected to exceed 1.0 ppm the areas (and/or) operations are to be identified and regulated. The project HSE Manager is responsible for contacting the client HSE department to ascertain area(s) or operations that (are/ or) have the potential to exceed 1.0 ppm level.

The project HSE Manager shall identify the areas or operations on a facility plot plan. The plot plan is to be included as part of the New Hire Orientation program, Hazard Communication Program, and Benzene Exposure training module.

Only employees trained in the hazards of Benzene are permitted to enter a Benzene regulated area.

All personnel entering a regulated area will wear all appropriate respiratory protection and protective clothing.

5.8 Communication of Benzene Hazards

5.8.1 Warning Signs

The employer must post warning signs at entrances to regulated areas. The act of posting serves to warn employees that they are entering a hazardous area. Such signs warn employees that entry is permitted only if they are authorized to do so, and there is a specific need to enter the area. Warning signs also supplement the training employees receive under this standard. The signs must read as follows:

DANGER
BENZENE
CANCER HAZARD
FLAMMABLE - NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATORY PROTECTION REQUIRED

5.8.2 Warning Labels

Employers must label containers of Benzene, except for pipes, located in the workplace. The labels must comply with the requirements of 29 CFR 1910.1200(f), and also, must read as follows:

DANGER
CONTAINS BENZENE-CANCER HAZARD

5.9 Exposure Monitoring

Personal exposure monitoring will be coordinated by the Project HSE Department.

5.9.1 Initial Monitoring

Initial personal monitoring will be performed to determine representative exposures for each job function in which exposures to Benzene may exceed the OSHA action limit or short-term exposure limit.

5.9.2 Periodic Monitoring

- For job functions in which initial monitoring indicates Benzene exposure above the action level, a periodic monitoring program will be established.
- Periodic Monitoring will be completed depending on exposure levels.
- For employees who are or may be exposed to Benzene at or above the action level 30 or more days per year -above the PEL 20 or more days for employees who have been exposed to more than 10 PPM of Benzene for 30 or more days in a year.
- Periodic monitoring will be conducted semi-annually when engineering controls or work practices do not reduce Benzene exposure below the PEL or STEL.
- Periodic monitoring will be conducted annually when engineering controls or work practices do not reduce Benzene exposures below the action level.

5.10 Employee Notification

- Each employee monitored will be notified in writing of his/her personal monitoring result within 15 days of the receipt of analytical results.
- In the event of overexposure, the individual will be notified of any corrective action through his/her supervisor.

5.11 Observation of Monitoring

The monitoring process may be observed by all employees whom the monitoring effects.

5.11.1 Atmospheric Testing

Benzene specific Draeger Tube, bag sample and gas chromatograph (GC) analysis shall be used to conduct atmospheric testing. Atmospheric testing will be conducted for confined spaces that have contained Benzene or other areas that have been identified as Benzene regulated areas.

5.12 Medical Surveillance

5.12.1 Initial and Periodic Medical Evaluations

- Employees working in areas who have potential exposure to Benzene shall receive pre-employment and periodic medical evaluations.
- If initial or periodic medical evaluations indicate an abnormal condition, further evaluations will be given and referrals made as determined by the project physician.

- Medical evaluations will be done periodically for individuals that have been identified as having Benzene exposures above 10 ppm for 30 or more days per year.
- Health effects of Benzene include eye and skin irritations and short term breathless, irritability, or euphoric.

5.12.2 Medical Evaluations as a Result of Emergency Exposures

- In the event of exposure, without the use of proper respiratory protection, to an unforeseen release of Benzene-containing vapor or liquid, the employee shall provide a urine specimen to the Project HSE Department.
- The specimen must be collected no sooner than 6 hours and no later than 8 hours following the exposure.
- If the urine specimen indicates an abnormal condition further evaluation will be performed and referrals made as determined by the project physician.

6.0 RECORDKEEPING

All Benzene related events shall be reported.

6.1.1 Incident Report

All Benzene exposure shall be recorded as Incidents on Robinson Brothers Construction, Inc. Incident Report.

6.1.2 Near Miss Reports

Failures in containment, control methods, isolation, etc., not resulting in employee exposure shall be recorded as near miss events on Robinson Brothers Construction, Inc. Near Miss Report.

6.1.3 Control & Retention

Records associated with this program shall be handled in the following manner. Incidents shall be handled per the Incident Reporting and Record Keeping Program. Records shall be retained for a minimum of the employee's duration of employment plus 30 years.

6.1.4 Medical Records

Medical records associated with Benzene medical surveillance will be maintained by the HSE Department.

An employee's medical records shall be made available to the Assistant Secretary, the Director, affected employees and designated employee representatives

7.0 REFERENCES

1.	**Documents & External References** Benzene Standard (29 CFR 1910.1028), https://www.osha.gov/Reduction_Act/1218-0129.html, http://wisha-training.lni.wa.gov/training/trainingkits/Benzene/Benzene2.ppt., www.Robinson Brothers Construction, Inc.shared.us/.../Safety%20Manual%20Sec%20C2%20Benzene%20Policy.pdf, www.p2sworld.com/hsemanual/Benzene_Awareness.doc,

8.0 REVISION INFORMATION

This section applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This Bloodborne Pathogen Exposure Control Plan has been established to ensure a safe and healthful working environment and act as a performance standard for all employees. This program applies to all occupational exposure to blood or other potentially infectious materials. The content of this plan complies with OSHA Standard 29 CFR 1910.1030 (Occupational Exposure to Bloodborne Pathogens).

1.1 Scope

All employees who have or may have the potential for exposure to blood or other potentially infectious materials in the workplace.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
None	None.

2.1 Key Responsibilities

2.1.1 Employer

- OSHA requires that all employers that can "reasonably anticipate exposure" of employees to infectious material to prepare and implement a written exposure control plan.
- Ensure the availability of the Hepatitis B vaccine that have occupational exposure at no cost.

2.1.2 Site Project Manager and Supervisors

Site project manager and supervisors are responsible for exposure control in their respective areas.

2.1.3 Exposure Control Officer

Exposure Control Officer Robinson Brothers Construction, Inc. CSO. Has overall responsibility for developing and implementing the Exposure Control Procedure for all facilities.

2.1.4 Employees

- Know what tasks they perform that have occupational exposure.
- Plan and conduct all operations in accordance with our work practice controls.
- Develop good personal hygiene habits.

3.0 SAFETY

3.1 Engineering Controls

Hand washing facilities (or antiseptic hand cleansers or antiseptic towelette), which are readily accessible to all employees who have the potential for exposure. Containers for contaminated reusable sharps that our clients provide have the following characteristics: Puncture-resistant; Color-coded or labelled with a biohazard warning label; Leak-proof on the sides and bottom. Secondary containers which are:

- Leak-proof; Color-coded or labelled with a biohazard warning label; Puncture - resistant, if necessary.

3.2 Personal Protective Equipment

Robinson Brothers Construction, Inc. provides at no cost to our employee's gloves, safety glasses, goggles, gowns, face shields/masks and other as need PPE for bloodborne pathogens response. All PPE shall be of the proper size and readily accessible. Our employees adhere to the following practices when using their personal protective equipment:

- Any garments penetrated by blood or other infectious materials are removed immediately.
- All potentially contaminated personal protective equipment is removed prior to leaving a work area.
- Gloves are worn whenever employees anticipate hand contact with potentially infectious materials or when handling or touching contaminated items or surfaces.
- Disposable gloves are replaced as soon as practical after contamination or if they are torn, punctured or otherwise lose their ability to function as an "exposure barrier".
- Masks and eye protection (such as goggles, face shields, etc.) are used whenever splashes or sprays may generate droplets of infectious materials.
- Any PPE exposed to bloodborne pathogens shall be disposed of properly.
- PPE shall be used unless employees temporarily declined to use PPE under rare circumstances.
- PPE should be cleaned, laundered & properly disposed of if contaminated.
- Robinson Brothers Construction, Inc. will repair and replace PPE as needed to maintain its effectiveness.

4.0 TRAINING

Employees with reasonable anticipated occupational exposure to bloodborne pathogens shall participate in training before their initial assignment and within one year of any previous training. Training shall include:

- What bloodborne pathogens are; how to protect themselves from exposure
- Methods of warnings (signs, labels, etc.)
- The OSHA requirements of bloodborne pathogens
- The availability of the Hepatitis B vaccine that have occupational exposure at no cost

4.1 Availability of Procedure to Employees

The Bloodborne Exposure Control Plan is kept at all locations and shall be accessible to employees.

4.2 Reviews and Update of the Procedure

The procedure is reviewed annually and updated whenever we establish new functional positions within our facility that may involve exposure to biohazards.

5.0 PROCEDURE

To limits occupational exposure to blood and other potentially infectious materials, exposure could result in transmission of bloodborne pathogens that, which can lead to disease and death.

5.1 Exposure Determination

- There are no job classifications in which some or all employees have occupational exposure to bloodborne pathogens that may result from the performance of their routine duties.
- Designated employees are trained to render first aid and basic life support. Rendering first aid or basic life support will expose employees to bloodborne pathogens and will require them to adhere to this program.
- In addition, no medical sharps or similar equipment is provided to, or used by, employees rendering first aid or basic life support.
- This exposure determination has been made without regards to the Personal Protective Equipment that may be used by employees.
- A listing of all first aid and basic life support trained employees in this work group shall be maintained at each work site and at each first aid kit.

5.2 Methods of Compliance Universal Precautions

Universal precautions are used for all materials possibly infectious: **William this was the only one that was missing**

- Under circumstances in which differential between body fluids is difficult or impossible, all body fluids will be considered potentially infectious.
- The employer shall post signs at the entrance to work areas specified in paragraph (e), HIV and HBV Research Laboratory and Production Facilities, which shall bear the following legend:

(Name of the Infectious Agent)
(Special requirements for entering the area)
(Name, telephone number of the laboratory director or other responsible person.)

BIOHAZARD

5.3 Work Practice Controls

- Employees shall wash their hands immediately, or as soon as feasible, after removal of potentially contaminated gloves or other personal protective equipment.
- Following any contact of body areas with blood or any other infectious materials, employees wash their hands and any other exposed skin with soap and water as soon as possible.

- Hand washing facilities shall be available. If hand washing facilities are not feasible Robinson Brothers Construction, Inc. will provide either an appropriate antiseptic hand cleanser in conjunction with cloth/paper towels or antiseptic towelette.
- Contaminated needles and other contaminated sharps should not be handled if you are not AUTHORIZED or TRAINED to do so. Contaminated needles and other contaminated sharps are not bent or recapped.
- Eating, drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in work areas where there is potential for exposure to biohazardous materials.
- Food and drink is not kept in refrigerators, freezers, on countertops or in other storage areas where potentially infectious materials are present.
- All equipment or environmental surfaces shall be cleaned & decontaminated after contact with blood or other potentially infectious materials.
- Specimens of blood or other potentially infectious materials must be put in leak proof bags for handling, storage and transport.
- If outside contamination of a primary specimen container occurs, that container is placed within a second leak proof container, appropriately labelled, for handling and storage.
- Bloodborne pathogens kits are located on top of first aid kits and are to be used in emergency situations by the caregiver. Once the seal is broken on kit and any portion has been used it is not to be reused. Pathogen Kits shall be ordered and replaced promptly. Biohazard bags are identified by stickers and located in the first aid area. Contaminated supplies are to be disposed at once.

5.4 Housekeeping

Our staff employs the following practices:

- All equipment and surfaces are cleaned and decontaminated after contact with blood or other potentially infectious materials.
- Protective coverings (such as plastic trash bags or wrap, aluminium foil or absorbent paper) are removed and replaced.
- All trash containers, pails, bins, and other receptacles intended for use routinely are inspected, cleaned and decontaminated as soon as possible if visibly contaminated.
- Potentially contaminated broken glassware is picked up using mechanical means (such as dustpan and brush, tongs, forceps, etc.).

5.5 Post-Exposure Evaluation & Follow-Up

If there is an incident where exposure to bloodborne pathogens occurred, we immediately focus our efforts on investigating the circumstances surrounding the exposure incident and making sure that our employees receive medical consultation and immediate treatment.

The Robinson Brothers Construction, Inc. CSO/ Supervisor investigates every reported exposure incident and a written summary of the incident and its causes is prepared and recommendations are made for avoiding similar incidents in the future. We provide an exposed employee with the following confidential information:

- Documentation regarding the routes of exposure and circumstances under which the exposure incident occurred.

- Identification of the source individual (unless not feasible or prohibited by law).

Once these procedures have been completed, an appointment is arranged for the exposed employee with a qualified healthcare professional to discuss the employee's medical status. This includes an evaluation of any reported illnesses, as well as any recommended treatment.

Information Provided to the Healthcare Professional. We forward the following:

- A copy of the Biohazards Standard.
- A description of the exposure incident.
- Other pertinent information.

Healthcare Professional's Written Opinion

After the consultation, the healthcare professional provides our facility with a written opinion evaluating the exposed employee's situation. We, in turn, furnish a copy of this opinion to the exposed employee. The written opinion will contain only the following information:

- Whether Hepatitis B Vaccination is indicated for the employee.
- Whether the employee has received the Hepatitis B Vaccination.
- Confirmation that the employee has been informed of the results of the evaluation.
- Confirmation that the employee has been told about any medical conditions resulting from the exposure incident which require further evaluation or treatment.
- All other findings or diagnoses will remain confidential and will not be included in the written report.

5.6 Labels and Signs

Biohazard warning labelling shall be used on containers of regulated waste; Sharps disposal containers; contaminated laundry bags and containers; contaminated equipment.

5.7 Information

Information provided to our employees includes:

- The Biohazards Standard itself.
- The epidemiology and symptoms of bloodborne diseases.
- The modes of transmission of bloodborne pathogens.
- Our facility's Exposure Control Procedure (and where employees can obtain a copy).
- Appropriate methods for recognizing tasks and other activities that may involve exposure.
- A review of the use and limitations of methods that will prevent or reduce exposure.
- Selection and use of personal protective equipment.
- Visual warnings of biohazards within our facility including labels, signs and "color-coded" containers.
- Information on the Hepatitis B Vaccine.
- Actions to take and persons to contact in an emergency involving potentially infectious material.
- The procedure to follow if an exposure incident occurs, including incident reporting.
- Information on the post-exposure evaluation and follow-up, including medical consultation.

- Access to a copy of the exposure plan shall be provided in a reasonable time, place, and manner.

6.0 RECORDKEEPING

All records shall be made available upon request of employees, OHSA's Assistant Secretary and the Director of OSHA for examination and copying. Medical records must have written consent of employee before released. Robinson Brothers Construction, Inc. Inspection shall meet the requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

The respective Human Resources representative shall maintain Bloodborne Pathogen exposure records. Employee medical records shall be kept confidential and are not to be disclosed without the employee's written consent, except as required by 29 CFR 1910.1030 or other law.

Medical records shall be maintained for the duration of employment plus 30 years and shall include at least the following:

- Employee's name, Social Security number and Robinson Brothers Construction, Inc. Inspection employee number.
- Employee's Hepatitis B vaccination status, including vaccination dates.
- All results from examinations, medical testing and follow-up procedures, including all health care professional's written opinions.
- Information provided to the health care professional.
- Any Hepatitis B Vaccine Declinations.

Training records shall be maintained for 3 years from the date on which the training occurred and shall include at least the following:

- Outline of training program contents.
- Name of person conducting the training.
- Names and job titles of all persons attending the training.
- Date of training.

7.0 REFERENCES

1.	**Documents & External References** OSHA Standard 29 CFR 1910.1030 (Occupational Exposure to Bloodborne Pathogens)

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
CAL OSHA CONFINED SPACE		
Version: 1.0	**Date Approved:** 31 October 2016	Health, and Safety Environmental **CSO:** Joe Bergren

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to ensure the safety of all employees and contractors working for Robinson Brothers Construction, Inc. and to comply with all regulations and host clients that pertain to confined spaces in California and shall be conducted in accordance with Cal/OSHA California Code of Regulations, Title 8, Section 5157.

1.1 Scope

This program covers all employees and other workers that may be involved in confined space entry in California. When work is performed on a non-owned or operated site, the operator's program shall take precedence. This document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Acceptable entry conditions	The conditions that must exist in a confined space to allow entry and to ensure that employees involved with a confined space entry can safely enter into and work within the space.
Attendant	An individual stationed outside one or more Confined spaces who monitors the authorized Entrants and who performs all Attendant's duties assigned in Robinson Brothers Construction, Inc., Inc. Confined Spaces Program. Attendants must have sufficiently completed and fully understands the Confined Space training and is approved by the HSE Manager to work in a confined space as an Attendant.
Authorized Entrant	An individual who is authorized by Robinson Brothers Construction, Inc. to enter a confined space. Entrants must have sufficiently completed and fully understands the Confined Space training and is approved by the HSE Manager to work in a confined space as an Authorized Entrant.
Blanking or Blinding	The absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

2.1 Roles and Responsibilities

2.1.1 Managers/Supervisor

- Shall ensure that all employees have been trained and fully understand the requirements of this program.
- Shall ensure that all confined space assessments have been conducted and documented.

- Shall ensure that provisions and procedures are in place for the protection of employees from external hazards including but not limited to pedestrians, vehicles and other barriers and by use of the pre-entry checklist verifying that conditions in the permit space are acceptable for entry during its duration.
- Shall ensure that all Permit-Required Confined Spaces permits are posted.
- Shall ensure that confined spaces are identified properly as either a Non-Permit Confined Space or a Permit-Required Confined Space.
- Responsible for posting permit-required confined spaces with warning signs to alert employees. If the workplace contains permit spaces, Robinson Brothers Construction, Inc. shall inform exposed employees and other employees performing work in the area, by posting danger signs or by any other equally effective means, of the existence, the location of and the danger posed by the permit spaces.

- Shall ensure that all confined spaces that have been identified as “no entry” have signs that state, “DANGER-DO NOT ENTER.”

- Shall ensure signs have been posted at all Permit-Required Confined Space areas that state, “DANGER – PERMIT ENTRY CONFINED SPACE” along with the proper warning word such as “ASPHYXIANT, FLAMMABILITY or TOXIC HAZARD.”
- Necessary equipment is provided at no cost to the employees, maintained properly and used properly. Equipment (PPE, communication, testing, ventilation, etc.) shall be provided to the employee at no cost and maintained in the proper manner.
- Robinson Brothers Construction, Inc. is responsible for reviewing the confined space program within one year and revising the program as necessary. Robinson Brothers Construction, Inc. will review the permit space program, using the cancelled permits retained under subsection (e)(6) of Cal/OSHA California Code of Regulations, Title 8, Section 5157 within 1 year after each entry and revise the program as necessary, to ensure that employees participating in entry operations are protected from permit space hazards.

2.1.2 Affected Employee

- Shall attend Confined Space Entry training commensurate with their duties and when duties change as required.
- Shall comply with all aspects of this program.
- Authorized Entrants, Attendants and Entry Supervisors may be any Robinson Brothers Construction, Inc. employee that is authorized by management to work in a confined space setting and that has been trained and is proficient in the understanding of program requirements.

2.1.3 Authorized Entry Supervisor Duties

- Shall have a tailgate safety meeting, with all workers to be involved in the confined space entry and review the job to be performed and what safety concerns may be present.
- Shall confirm that all isolation, Lock/out and Tag/outs have been completed prior to entry into a confined space.
- Shall ensure that the requirements of this program are followed and maintained

- Shall test all atmosphere conditions prior to entry and shall complete and maintain the confined space permit form, and have it accessible for review on the job site at all times.
- Shall notify Robinson Brothers Construction, Inc. supervisor of entry into a confined space, and notify the supervisor of any changes that may occur, during an entry.
- If the confined space poses a hazard that cannot be eliminated, the Entry Supervisor must arrange for a rescue services.
- If the confined space poses no hazards to the Entrants, the Entry Supervisor can reclassify the confined space to a Non-Permit Confined Space.
- A stand-by rescue team is not required to be on site for Non-Permit Confined Space entries.

2.1.4 Authorized Attendant Duties

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Is aware of possible behavioral effects of hazard exposure in authorized Entrants.
- Continuously maintains communication and an accurate count of authorized Entrants in the confined space and ensures that the means used to identify authorized Entrants, and accurately identifies who is in the confined space.
- Remains outside the confined space during entry operations until relieved by another Attendant.
- Robinson Brothers Construction, Inc. has procedures to be used by a single attendant monitoring several confined spaces during an emergency. If more than one confined space is to be monitored by a single attendant, the program must include the means and procedures that will be used in order to enable the attendant to respond to emergencies in one or more permit spaces that he/she is monitoring without distraction from all responsibilities. This will include radio communications with emergency responders or other methods of summoning aid, directing entrants to leave the confined spaces, etc. The procedures shall be on the confined space permit.
- Monitors activities inside and outside the confined space to determine if it is safe for Entrants to remain in the space and orders the authorized Entrants to evacuate the confined space immediately under any of the following conditions:
- If the Attendant detects a prohibited condition;
- If the Attendant detects the behavioral effects of hazard exposure in an authorized Entrant;
- If the Attendant detects a situation outside the space that could endanger the authorized Entrants;
- If the Attendant cannot effectively and safely perform all the duties required.
- Summon rescue and other emergency services as soon as the Attendant determines that authorized Entrants may need assistance to escape from confined space hazards.
- Takes the following actions when unauthorized persons' approach or enter a confined space while entry is underway:
- Warn the unauthorized persons that they must stay away from the confined space;
- Advise the unauthorized persons to exit the confined space immediately, if they have entered the space;

- Inform the authorized Entrants and the Entry Supervisor if unauthorized persons have entered the confined space.
- Performs no duties that might interfere with the Attendant's primary duty to monitor and protect the authorized Entrants.
- Authorized Attendants shall not monitor more than one confined space at a time.

2.1.5 Authorized Entrant Duties

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Uses appropriate personal protective equipment properly, e.g., face and eye protection, and other forms of barrier protection such as gloves aprons, coveralls, and breathing equipment;
- Is aware of possible behavioral effects of hazard exposure in authorized Entrants;
- Shall witness and verify calibrated air monitoring data and if approved, sign off, before entry is made.
- Is entitled to request additional monitoring at any time.
- Maintain communication with the Attendants to enable the Attendant to monitor the Entrants status as well as to alert the Entrant to evacuate if needed; and
- Exit from confined spaces as soon as possible when ordered by an Attendant or Entry Supervisor, when the Entrant recognizes the warning signs or symptoms of an exposure exists, or when a prohibited condition exists, or when an alarm is activated.

3.0 SAFETY

In general, confined space regulations require all employers to have:

- A written confined space plan, including recognizing and marking all confined spaces on site;
- Procedures to test and monitor the air inside confined spaces before and during all employee entries,
- Procedures to prevent unauthorized entries and to have an attendant outside the space at all times,
- Effective controls of all existing atmospheric or safety hazards inside the confined space;
- Employee and supervisor training on safe work procedures, hazard controls, and rescue procedures, and
- Effective rescue procedures which are immediately available on site.

4.0 TRAINING

Training shall be provided so that all employees whose work is regulated by this program acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them.

Training shall be provided to all affected employees prior to being assigned duties and/or prior to a change in assigned duties. Training shall be provided to each affected employee:

- Before the employee is first assigned duties under this section (g) of Cal/OSHA California Code of Regulations, Title 8, Section 5157,
- Before there is a change in assigned duties;

- Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained,
- Whenever Robinson Brothers Construction, Inc. has reason to believe either that there are deviations from the permit space entry procedures required by subsection (d)(3) of Cal/OSHA California Code of Regulations, Title 8, Section 5157 or that there are inadequacies in the employee's knowledge or use of these procedures.

Robinson Brothers Construction, Inc. is responsible for providing refresher training and at a certain frequency. Training shall be provided whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by subsection (d)(3) of Cal/OSHA California Code of Regulations, Title 8, Section 5157 or that there are inadequacies in the employee's knowledge or use of these procedures.

Training is documented. Robinson Brothers Construction, Inc. shall certify that the training required has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

5.0 PROCEDURE

5.1 Process for Confined Space Operations That May be Performed by Contractors

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

- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section(c)(8), section 5158 or section 8355 of Cal/OSHA California Code of Regulations, Title 8, depending on which section applies to the contractor,
- Apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space,
- Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working,
- Coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by subsection (d) (11) of Cal/OSHA California Code of Regulations, Title 8, and
- Debrief the contractor at the conclusion of the entry operations regarding the permit spaced program followed and regarding any hazards confronted or created in permit spaces during entry operations.

5.1.1 Written Confined Space Policy/Program

If Robinson Brothers Construction, Inc. decides that its employees will enter permit spaces, Robinson Brothers Construction, Inc. shall develop and implement a written permit space program that complies with Cal/OSHA California Code of Regulations, Title 8, Section 5157. The written program shall be available for inspection by employees and their authorized representatives.

5.1.2 Process to Identify and Classify All Confined Spaces That May Exist at a Site

Robinson Brothers Construction, Inc. shall evaluate the workplace to determine if any spaces are permit-required confined
spaces.

5.1.3 Non-Permit Confined Space Entry

If testing of the confined space atmosphere is within acceptable limits without the use of forced air ventilation and the space is properly isolated, the space can be entered by following the requirements for Level I confined space entry.

- Entrants and/or their representative shall be given the opportunity to observe and participate in the air monitoring process.
- Entrants shall review and sign the confined space permit.

Employees may enter and work in the confined space as long as LEL, O2, and toxicity hazards remain at safe levels:

- Complete the Robinson Brothers Construction, Inc. Confined Space Entry Permit to document that there are no confined space hazards. Make this certification available to all personnel entering the space.
- A trained Attendant must always be outside the confined space. The Attendant must monitor the authorized Entrants for the duration of the entry operation.

5.1.4 Permit-Required Confined Space Entry

Robinson Brothers Construction, Inc. is responsible for performing a hazard assessment of the permit-required
confined space(s). Robinson Brothers Construction, Inc. shall identify and evaluate the hazards of permit spaces before employees enter them.

Safe entry procedures, detailing who may enter and under what conditions, for all permit-required confined spaces shall be established per this policy. Robinson Brothers Construction, Inc. will develop and implement the means, procedures and practices necessary for safe permit space entry operations, including, but not limited to, the following:

A. Specifying acceptable entry conditions,

B. Isolating the permit space,

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

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

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

5.2 General Requirements

- Complete the Robinson Brothers Construction, Inc. Confined Space Entry Permit before proceeding with work in a Permit-Required Confined Space.
- Entrants and/or their representative shall be given the opportunity to observe and participate in the air monitoring process.
- Entrants shall review and sign the confined space permit.
- At least one trained Attendant must always be outside the Permit-Required Confined Space.
- The Attendant must monitor the authorized Entrants for the duration of the entry operation.
- Only authorized Entrants may enter a Permit-Required Confined Space.

- All Entrants must sign in and out on the entry permit when entering and leaving a Permit-Required Confined Space.
- The back of the permit or a sign-in sheet must be used for this purpose.
- Post signs and barricades outside all Permit-Required Confined Spaces to notify personnel that a confined space entry is in progress and unauthorized entry is prohibited.
- Conditions must be continuously monitored where Entrants are working to determine that acceptable conditions are maintained during entry.

If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space, and follow the list below:

1. The Entry Supervisor shall cancel the entry permit.
2. Re-evaluate the space to determine how the hazardous atmosphere developed.
3. Take action to protect personnel before any subsequent activity to re-enter the space takes place.
4. Re-issue the Robinson Brothers Construction, Inc. Confined Space Entry Permit before allowing Entrants to re-enter the space.
5. Employees or their representatives are entitled to request additional monitoring at any time.

- The permit must be terminated when the entry operations are complete or when permit conditions change (i.e., hazardous air monitoring results are noted, unsafe behaviors are observed, etc.).
- Permit-Required Confined Space entry operations will be reviewed when Robinson Brothers Construction, Inc. believes that the requirements of this confined space program may not adequately protect personnel.
- If deficiencies are found in the program, the program will be revised and personnel will be trained in the
- new revisions before subsequent entries are authorized.

5.3 Reclassification of Confined Spaces

When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, Robinson Brothers Construction, Inc. shall re-evaluate that space and, if necessary, reclassify it as a permit-required confined space. A space classified by Robinson Brothers Construction, Inc. as a permit-required confined space may be reclassified as a non-permit confined space under the following procedures:

- If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
- If it is necessary to enter the permit space to eliminate hazards, such entry shall be performed under subsections (d) through (k) of the statute [Permit Confined Space Entry Procedures]. If testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated, the permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.

Action to be taken should hazards arise within a permit space that was then declassified to a non-permit space - If hazards arise within a permit space that has been declassified to a non-permit space, each

employee in the space shall exit the space. Robinson Brothers Construction, Inc. shall then re-evaluate the space and determine whether it must be reclassified as a permit space.

5.4 Pre-Job Planning and Space Preparation

- The Entry Supervisor must determine that the confined space is properly isolated by blinding, disconnecting, and/or by following local Lockout/Tagout procedures.
- The Entry Supervisor must discuss with all Entrants the hazards of the space, communication methods and emergency procedures during the confined space entry.
- Eliminate any condition making it unsafe to open the equipment to atmosphere.
- Promptly guard the opening to prevent an accidental fall through the opening and to protect each employee working in the space from foreign objects entering the space.
- If applicable, wash, steam, ventilate or degas the confined space to properly free it of possible contaminants. Vent vapors to a safe location.

Robinson Brothers Construction, Inc. is responsible for implementing measures necessary to prevent unauthorized entry. Robinson Brothers Construction, Inc. will take the following actions when unauthorized persons' approach or enter a permit space while entry is underway:

- Warn the unauthorized persons that they must stay away from the permit space,
- Advise the unauthorized persons that they must exit immediately if they have entered the permit space, and
- Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space,

If performing hot work in the confined space, precautions must be taken consistent with the Robinson Brothers Construction, Inc. Hot Work Permit procedure.

Ensure that vehicle or other equipment exhaust does not enter the space.

5.5 Pre-Entry Safety Meeting

- The Entry Supervisor must declare when the confined space is ready for entry.
- The Entry Supervisor shall hold a pre-entry safety meeting to discuss all requirements and procedures with all authorized Entrant(s) and Attendant(s) involved with the entry. He/she will discuss other concerns such as previous contents, vessel coating, PPE required etc., during this meeting.
- The Entry Supervisor must coordinate entry operations when employees of more than one Robinson Brothers Construction, Inc. are working simultaneously in the confined space. This coordination is necessary so that one Robinson Brothers Construction, Inc.'s work does not endanger the employees of another Robinson Brothers Construction, Inc..

5.6 Equipment

Check all work equipment to ensure that it has the proper safety features and is approved for the locations where it will be used. The Entry Supervisor shall ensure that all equipment is properly maintained in a safe condition and that Entrants use the equipment properly.

The following equipment must be considered and may be required when entering a confined space:

- Atmospheric Testing and Monitoring Equipment.

- Barriers, Shields, and Signs – Post signs and barricades outside all Permit-Required Confined Spaces to notify personnel that a confined space entry is in progress and unauthorized entry is prohibited. Any sign used must state "Danger – Permit Entry Confined Space" along with the proper warning word such as "Asphyxiant, Flammability or Toxic Hazard". All barricades must be capable of preventing a person from inadvertently walking into or kicking an object into the space.
- Communications Equipment – Only use intrinsically safe equipment in areas where a hazardous atmosphere may exist. Use a communication system that will keep the Attendant in constant, direct communication with the Entrant(s) working in the confined space. Also, use a communication system that allows the Attendant to summon help from rescue or emergency service.
- Entry and Exit Equipment – (For example: ladders may be needed for safe entry and exit).
- Lighting Equipment – Needed for safe entry, work within the space and exit. Lighting equipment used in the confined space must be certified safe for the location.
- Portable electric lighting used in wet and/or other conductive locations (drums, tanks, vessels) must be operated at 12 volts or less. 120 volt lights may be used if protected by a ground-fault circuit interrupter.
- Personal Protective Equipment – Ensure that personnel wear the required personal protective equipment. For respiratory protection requirements, refer to the Respiratory Protection Program.
- Rescue and Emergency Equipment– Except if provided by outside rescue services.
- The Attendants must also have an approved first aid kit.
- Vacuum Trucks– When used, trucks must be properly grounded or bonded to prevent static sparks.
- Ventilating Equipment – Local exhaust air movers used to obtain acceptable atmospheric entry conditions (e.g., Copus air movers).

5.6.1 Requirements for Air Monitoring

Robinson Brothers Construction, Inc. will evaluate permit space conditions as follows when entry operations are conducted:

- Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working,
- Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations, and
- When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors.
- Provide each authorized entrant or that employee's authorized representative an opportunity to observe the pre-entry and any subsequent testing or monitoring of permit spaces,

- Re-evaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that Robinson Brothers Construction, Inc. conduct such re-evaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate
- Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted in accord with Cal/OSHA California Code of Regulations, Title 8, Section 5157(d)(5).
- Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Monitoring of the space must inform the entrants of the potential hazards and results and they must participate in the permit review and signing.
- Air shall be periodically test while continuous ventilation is applied.

5.6.2 Ventilation

Continuous forced air ventilation must be used and tested as follows:

- An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere,
- The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space,
- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee, who enters the space, or that employee's authorized representative, shall be provided with an opportunity to observe the periodic testing and may request additional monitoring at any time.
- If a hazardous atmosphere is detected during entry each employee shall leave the space immediately and the space shall be evaluated to determine how the hazardous atmosphere developed; and measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

5.6.3 Multiple Employer Procedure

In order, not to endanger the employees of any other employer, the Entry Supervisor shall:

- Verify that all contractor employees have been trained in confined space and that all contractor employees fully understand the Robinson Brothers Construction, Inc. Procedures pertaining to Confined Space.
- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section.
- Apprise the contractor of the elements, including the hazards identified and the employees experience with the space, that make the space in question a permit space.

- Inform the contractor of any precautions or procedures that Robinson Brothers Construction, Inc. has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.
- Coordinate entry operations with the contractor, when both Robinson Brothers Construction, Inc. personnel and contractor personnel will be working in or near confined spaces.
- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in confined spaces during entry operations.
- In addition to complying with the confined space requirements that apply to all employees; each contractor, who is retained to perform permit space entry operations, shall:

  1. Obtain any available information regarding confined space hazards and entry operations from the Robinson Brothers Construction, Inc. Entry Supervisor.

  2. Coordinate entry operations with the Robinson Brothers Construction, Inc. Entry Supervisor, when both Robinson Brothers Construction, Inc. personnel and contractor personnel will be working in or near permit spaces.

  3. Inform Robinson Brothers Construction, Inc. of the confined space program that the contractor will follow and of any hazards confronted or created in the confined space, either through a debriefing or during the entry operation.

5.7 Rescue Procedures Be Developed as Part of Permit-Required Confined Space Entries

Robinson Brothers Construction, Inc. shall develop and implement procedures for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, for summoning additional rescue and

emergency services, and for preventing unauthorized personnel from attempting a rescue.

Robinson Brothers Construction, Inc. shall ensure at least one standby person at the site is trained and immediately available to perform rescue and emergency services for any permit-required confined space entries, including those with IDLH atmospheres.

Rescue service must be on-site for immediately dangerous to life and health (IDLH) conditions while work is being performed. Rescue services must be either:

- Provided by the host facility,
- Provided by an outside service which is given an opportunity to examine the entry site, practice rescue and decline as appropriate, or
- Provided by Robinson Brothers Construction, Inc. by selecting a rescue team that is equipped and trained to perform the needed rescue services.
- The Attendant shall order the other Entrants not to move the injured nor allow untrained or unauthorized workers into the space that are not trained to handle a confined space rescue.

Permit-Required Confined Space Rescue:

- When the Attendant becomes aware of the need for rescue, the Attendant shall immediately summon the on-site rescue team by the agreed upon communication method, verbally, radio or cell phone, without leaving the vicinity of the confined space.
- The Attendant shall prevent unauthorized personnel from attempting a rescue.

- After the rescue team, has been notified, the Attendant shall alert the Entry Supervisor of the emergency via the same communication methods.
- The preferred means of providing rescue service is through the use of a qualified outside rescue service vendor (client host). The outside rescue service vendor must be:
    1. Informed of the hazards that they may confront during a rescue;
    2. Provided access to the Permit-Required Confined Space to examine the entry site, practice rescue, and decline as appropriate.
    3. Access to the space allows the rescue service and local supervision to jointly develop appropriate rescue plans.
    4. If the host operator is designated to provide rescue services for Robinson Brothers Construction, Inc., the agreement of services must be included in contract for the job.
- If Robinson Brothers Construction, Inc. employees are to perform Permit-Required Confined Space rescues, they must be:
    1. Provided and trained in the use of the proper personal protective equipment necessary to make the rescue;
    2. Trained to perform the assigned duties;
    3. Required to practice making rescues at least once every 12 months;
    4. Trained in basic first aid and CPR.
    5. A minimum of one member of the rescue team must hold a current certification in first aid and CPR.

Non-entry Rescue:

- To facilitate non-entry rescue, an Entrant must be attached to a retrieval system whenever he/she enters a Permit-Required Confined Space with a vertical depth of more than 5 feet.
- The retrieval equipment is not required if it will increase the overall risk of the entry, e.g., creating an entanglement hazard, or will not contribute to the rescue of the Entrant.
- Each Entrant shall use a full body harness equipped with a "D" ring located between the shoulders or above the head.
- Wristlets may be used instead of the full body harness, if the use of the full body harness is not feasible or creates a greater hazard and that using wristlets is the safest and most effective alternative.
- The retrieval line must be attached to the "D" ring and the other end of the retrieval line attached to a retrieval device or fixed point located outside the space so that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.

5.8 System for the Preparation, Issuance, Use and Cancellation of Entry Permits

Robinson Brothers Construction, Inc. must develop and implement a system for the preparation, issuance, use and
cancellation of entry permits. Those requirements include:

- Only when all pre-entry requirements are satisfied, the Entry Supervisor shall issue a completed and signed confined space permit. The confined space permit is valid for one shift.

- In the event of any unauthorized entry, employee complaints, a hazard not covered by the permit, the occurrence of an injury or near miss the entry permit shall be cancelled and a review shall be conducted to provide employee protection and for revising the program prior to authorizing subsequent entries.
- All permit-required confined space permits are evaluated by a qualified person and maintained for at least 1 year Robinson Brothers Construction, Inc., Inc. shall retain each canceled entry permit
- For at least 1 year to facilitate the review of the permit space program required by subsection (d) (14) of Cal/OSHA California Code of Regulations, Title 8, Section 5157. Any problems encountered during an entry operation shall be noted on the pertinent permit so that appropriate revisions to the permit space program can be made.
- The Entry Supervisor shall terminate the confined space permit, at the end of the job operation, at the end of the shift or when the Entry Supervisor or Attendant determine that conditions in or near the confined space have changed and is hazardous to the Entrants.
- The Entry Supervisor shall, at the conclusion of entry operation, close out the permit and provide the safety department the original copy of the Confined Space Permit.

6.0 RECORD KEEPING

An accurate record of the medical surveillance required shall be retained. This record shall be retained for the period specified and meet the criteria of (§3204. Access to Employee Exposure and Medical Records). The record required shall include at least the following information:

- The name and social security number of the employee.
- Physician's written opinions, recommended limitations, and results of examinations and tests.
- Any employee medical complaints related to exposure to hazardous substances.
- A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

7.0 REFERENCES

1.	**Documents & External References** § 5192. Hazardous Waste Operations and Emergency Response; Subchapter 7. General Industry Safety Orders, Group 16. Control of Hazardous Substances, Article 109. Hazardous Substances and Processes, https://www.ehs.uci.edu/programs/safety/confinedspace.html, Cal/OSHA Pocket Guide for the Construction Industry | June 2015,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
Cal OSHA ELECTRICAL HIGH LOW - VOLTAGE		
Version: 1.0	**Date Approved:** 31 October 2016	Health, and Safety Environmental **CSO:** Joe Bergren

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this Electrical Safety is to ensure the safety of all employees and contractors working for Robinson Brothers Construction, Inc. and provide minimum safety requirements and assist in the elimination of accidents which may result from the operation, installation, removal, use and maintenance of electrical equipment and tools.

1.1 Scope

This program covers all employees and other workers that may be involved in confined space entry. When work is performed on a non-owned or operated site, the operator's program shall take precedence. This document covers Robinson Brothers Construction, Inc.s' employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Definitions: The following definitions are used in this discussion of electrical safety.

Term	Description
Authorized Person	An individual recognized by management as having the responsibility for and expertise to perform electrical procedures in the course of normal duties. Such individuals are normally members of electronic or electrical groups.
Electrical Hazard	A potential source of personnel injury involving, either directly or indirectly, the use of electricity.
Direct Electrical Hazard	A potential source of personnel injury resulting from the flow of electrical energy through a person (electrical shocks and burns).
Indirect Electrical Hazard	A potential source of personnel injury resulting from electrical energy that is transformed into other forms of energy (e.g., radiant energy, such as light, heat, or energetic particles; magnetic fields; chemical reactions, such as fire, explosions, the production of noxious gases and compounds; and involuntary muscular reactions).
Grounding Point	The most direct connection to the source of a potential electrical hazard such as the terminals of a capacitor. Such a point must be indicated by a yellow circular marker.
Qualified Person	An individual recognized by management as having sufficient understanding of a device, system, or facility to be able to positively control any hazards it may present.

2.1 Responsibility

All Robinson Brothers Construction, Inc. personnel are responsible for all aspects of safety within their groups.

2.1.1 Manager

Each manager is responsible for being aware of all potentially hazardous activities within the area of responsibility. May assign responsibility or delegate authority for the performance of any function, (BUT) always remains accountable to higher management for any oversight or error that leads to injury, illness, or damage to property.

2.1.2 Supervisor

Each employee acting in a supervisory capacity has specific safety responsibilities. This includes:

- Developing an attitude and awareness of safety in the people supervised and seeing that individual safety responsibilities are fully carried out.
- Maintaining a safe work environment and taking corrective action on any potentially hazardous operation or condition.
- Ensuring that the personnel he/she directs are knowledgeable and trained in the tasks, they are asked to perform.
- Ensuring that safe conditions prevail in the area and that everyone is properly informed of the area's safety regulations and procedures.
- Ensuring that contract personnel is properly protected by means of instructions, signs, barriers, or other appropriate resources.
- Ensuring that no employee assigned to potentially hazardous work appears to be fatigued, ill, emotionally disturbed, or under the influence of alcohol or drugs (prescription, over the counter medicinal or otherwise).
- Management at every level has the responsibility for maintaining the work environment at a minimal level of risk throughout all areas of control.

2.1.3 The Company Safety Officer (CSO)

Responsible involve providing information, instruction, and assistance, as appropriate, concerning Robinson Brothers Construction, Inc. electrical safety requirements and procedures.

2.1.4 Employees

All individual employees are responsible for their own and their co-workers' safety. This means:

- Become acquainted with all potential hazards in the area in which they work.
- Learn and follow the appropriate standards, procedures, and hazard-control methods.
- Never undertake a potentially hazardous operation without consulting with appropriate supervision.
- Stop any operation you believe to be hazardous.

- Notify a supervisor of any condition or behavior that poses a potential hazard.
- Wear and use appropriate protective equipment.
- Immediately report any occupational injury or illness to the CSO, any on site Medical Services Department and the appropriate supervisor.

3.0 SAFETY

Use proper personal protective equipment, shields, and/or barriers providing effective electrical insulation from energized circuits. Provide adequate lighting. Do not enter areas with exposed energized parts unless illumination (lighting) is provided so that employee may work safely.

3.1.1 Personal Protective Devices

For work on any energized circuitry with a Class B or Class C hazard, the use of personal protective devices (e.g., face shields, blast jackets, gloves, and insulated floor mats) is encouraged, even if not required.

3.1.2 Safety Glasses

Either safety glasses or a face shield must be worn when working on electrical equipment.

3.1.3 Insulating Personal Protective Equipment

Insulating PPE will be provided by Robinson Brothers Construction, Inc. for employees that will be exposed to energized equipment; employees will be trained in the proper use of the provided insulating PPE.
Rubber protective equipment shall be in accordance with the provisions of the American National Standards Institute (ANSI), ANSI (J6) series, as follows:

Item	Standard	
Rubber insulating gloves: Rubber matting for use around electric	J6.6-1971	
Apparatus	J6.7-1935	(R1971)
Rubber insulating blankets	J6.4-1971	
Rubber insulating hoods	J6.2-1950	(R1971)
Rubber insulating line hose	J6.1-1950	(R1971)
Rubber insulating sleeves	J6.5-1971	

- Insulating gloves will be rated for the voltage that is to be concerned. Gloves issued for work on or near live low voltage exposed conductors will not be used on or near live high voltage exposed conductors, only gloves issued for high voltage will be used for high voltage exposed conductors.
- During the time work is being done on any exposed conductors or exposed parts of equipment connected to high-voltage systems, a qualified electrical worker, or an employee in training, shall be in close proximity at each work location to:

  1) Act primarily as an observer for the purpose of preventing an accident, and

2) Render immediate assistance in the event of an accident. Such observer will not be required in connection with work on overhead trolley distribution circuits not exceeding 1,500 volts D.C. where there is no conductor of opposite polarity less than 4 feet therefrom, or where such work is performed from suitable tower platforms or other similar structures.

3) Rubber protective equipment shall be visually inspected prior to use. Also, an "air" test shall be performed for rubber gloves prior to use.

4) Protective equipment of material other than rubber shall provide equal or better electrical and mechanical protection.

3.1.4 Protective Hats

Protective hats shall be in accordance with the provisions of ANSI Z89.2-1971 Industrial Protective Helmets for Electrical Workers, Class B, and shall be worn at the job site by employees who are exposed to the hazards of falling objects, electric shock, or burns.

3.1.5 Inspection & Maximum Test Intervals of Insulating PPE

All insulating PPE must be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection. Such tests include:

- All insulating PPE shall be tested periodically and marked with the latest test date,
- Any insulating PPE not marked will be tested immediately.
- Insulating PPE determined to be defective in the course of their use or when periodically inspected or tested shall be immediately removed from service and labeled 'Defective Equipment – DO NOT USE' or disposed of.

3.1.6 Inspection Test Intervals

5) Blankets-before first issue/every 12 months after that,

6) Gloves-before first issue and every six months,

7) Sleeves before first issue and every 12 months.

Note: Covers and Line hose shall be testing if the insulating value is suspect.

4.0 TRAINING

4.1.1 Training Requirements for Qualified Persons

Employees shall be trained in the skills and techniques to:

- distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2, and

- the decision-making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.

4.1.2 Employees Training for Specific Hazards Related to Electrical Energy

Robinson Brothers Construction, Inc. Employees shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective jobs. Robinson Brothers Construction, Inc. employees shall be trained to identify and understand the relationship between electrical hazards and possible injury. Documentation shall be made when the employee demonstrates proficiency, be maintained for the duration of the employee's employment, and contain each employee's name and date of training.

5.0 PROCEDURE

It is the policy of Robinson Brothers Construction, Inc. to follow the fundamental principles of safety, which are described below. A clear understanding of these principles will improve the safety of working with or around electrical equipment.

5.1.1 Housekeeping and Cleanliness

Housekeeping is a term used to describe the cleaning of the work site and surrounding areas of construction project-related debris. The term also refers to the managing and storing of materials that are used on the project. Listed below are the general requirements for housekeeping to which all work sites are subject. *Construction Safety Orders Article 3. General, 1513:*

- Work surfaces, passageways, and stairs shall be kept reasonably clear of scrap lumber and debris.
- Ground areas within six ft. of buildings under construction shall be kept reasonably free of irregularities. 1513(b)
- Storage areas and walkways on construction sites shall be kept reasonably free of dangerous depressions, obstructions, and debris. 1513(c)
- Piled or stacked material shall be placed in stable stacks to prevent it from falling, slipping, or collapsing. 1549(a)
- The material on balconies or in other similar elevated locations on the exteriors of buildings under construction shall be placed, secured, or positively barricaded in order to prevent the material from falling. 1549(h).

Note: It is important to remember that work sites subject to specific Safety Officer (SO') s may have additional housekeeping requirements with which to comply.

5.1.2 Maintain for Safety

Completed designs should include provisions for safe maintenance. Maintain for safety. Good maintenance is essential to safe operations. Maintenance procedures and schedules for servicing and maintaining equipment and facilities, including documentation of repairs,

removals, replacements, and disposals, should be established. Document your work. An up-to-date set of documentation adequate for operation, maintenance, testing, and safety should be available to anyone working on potentially hazardous equipment. Keep drawings and prints up to date. Dispose of obsolete drawings and be certain that active file drawings have the latest corrections.

Have designs reviewed. All systems and modifications to systems performing a safety function or controlling a potentially hazardous operation must be reviewed and approved at the level of project engineer or above. Have designs and operation verified. All systems performing safety functions or controlling a potentially hazardous operation must be periodically validated by actual test procedures at least once a year, and both the procedures and actual tests must be documented.

5.1.3 Test Equipment Safety

Tests should be made when the electrical equipment is de-energized, or, at most, energized with reduced hazard. Know emergency procedures. All persons working in areas of high hazard (with high-voltage power supplies, capacitor banks, etc.) must be trained in emergency response procedures, including cardiopulmonary resuscitation (CPR) certification.

5.2 Working with Energized Equipment

This section contains safety requirements that must be met in constructing electrical equipment and in working on energized electrical equipment. Special emphasis is placed on problems associated with personnel working on hazardous electrical equipment in an energized condition. Such work is permissible, but only after an extensive effort to perform the necessary tasks with the equipment in a securely de-energized condition has proven unsuccessful, or if the equipment is so enclosed and protected that contact with hazardous voltages is essentially impossible.

5.2.1 De-Energized

Electrical systems must be worked on in the de-energized state whenever feasible. Energized electrical work should only be performed in situations where lockout practices increases the hazards to workers and/or equipment, or it is not feasible such as when performing metering and testing.

5.2.2 Energized Electrical Work

Energized electrical work is only acceptable for tasks that can only be performed with the equipment energized or when the use of de-energized electrical work procedures presents a greater hazard. Cal/OSHA has defined such work as repair, maintenance, troubleshooting, or testing on electrical circuits, components, or systems while energized or live. No other activities shall be performed while energized.

Due to the degree of electrical hazards associated with this type of work, the following must be met:

- Responsible supervision must determine that the work requires the equipment or systems to be energized in order for the work to be performed

- Involved personnel has received instructions on the work techniques and hazards involved in working on energized equipment.
- In order to perform work while equipment or systems are energized the workers must be trained to be deemed as qualified (Qualified Electrical Worker)
- Personal protective equipment and safeguards are provided and used

a. The following work practices must be used to provide protection:

- Obtain permission via an energized work permit from Supervisor to work on or near energized electrical circuits.
- Unqualified Employees are prohibited from working on or near exposed energized circuits.
- Lockout and Tagout all circuits are possible.
- Treat all circuits as energized until proven otherwise.
- Remove all conductive clothing and jewelry (rings, watches, wrist/neck chains, metal buttons, metal writing instruments, etc.).
- Use proper personal protective equipment, shields, and/or barriers to provide effective electrical insulation from energized circuits. Provide adequate lighting. Do not enter areas with exposed energized parts unless illumination (lighting) is provided so that employee may work safely.
- Measuring tapes or measuring ropes which are metal or contain conductive strands shall not be used when working on or near energized parts.
- Unless suitable barriers are in place, the fish tape will not be used in raceways entering enclosures containing exposed energized parts.
- Protective shields, barriers, or insulating materials must be used to protect each employee from shock, burns, or other electrical injuries while that person is working near exposed energized parts that might be accidentally contacted or where dangerous electric heating or arcing might occur.
- Employees entering a Confined Space with exposed energized parts must use protective barriers, shields, or equipment or insulating materials rated at or above the present voltage to avoid contact with the energized part(s).
- Doors or other hinged panels shall be constructed and secured to prevent them from swinging into an employee and causing contact with exposed energized parts.
- Maintenance activities in areas of exposed energized parts may not be completed in areas with close contact unless adequate safeguards (insulation equipment or barriers) are present.

- Conductive cleaning material (Steel Wool, Silicon Carbide, etc.) or liquids may not be used unless procedures (Lock and Tag Out, etc.) are in place and followed.
- Station a safety observer outside the work area. The sole function of this person is to quickly de- energize all sources of power or pull worker free from electrical work area with a non-conductive safety rope if contact is made with an energized electrical circuit.
- A person qualified in CPR must be readily available to the scene.
- Work shall not be performed on exposed energized parts of equipment or systems until the following conditions are met:
- Responsible supervision has determined that the work is to be performed while the equipment or systems are energized.
- Involved personnel has received instructions on the work techniques and hazards involved in working on energized equipment.
- Suitable personal protective equipment and safeguards are provided and used.

5.3 Qualified Electrical Worker

Employees must receive training in avoiding the electrical hazards associated with working on or near exposed energized parts prior to performing energized electrical work. Such training will be provided when the employee is initially assigned to the job and refresher training will be provided yearly. The following will be included in the training:

- Control of hazardous energy and lockout/tagout training program including safe work practices required to safely de-energize electrical equipment.
- Skills and techniques to distinguish exposed live parts from other parts of electrical equipment. Performing on the job training with a skilled and experienced technician
- Skills and techniques to determine the nominal voltage of exposed live parts
- Clearance distances corresponding to the voltage of live parts
- Selection and use of personal protective equipment, tools, insulating and shielding materials and equipment for working on or near energized parts
- Selection and use of proper work practices for working on or near energized parts

Qualified electrical workers must also be trained in recognizing sign and symptoms of electrical shock, heart fibrillation, electric burns, and proper first aid protocols for these conditions. They must have training in Basic Cardio Pulmonary Resuscitation (CPR), Automatic External Defibrillator (AED), and contacting emergency personnel.

Only Qualified Electrical Workers are permitted to perform energized electrical work on equipment or systems operating at greater than 600 volts. Employees are qualified after a minimum of two years of training and experience with high-voltage circuits and equipment and have become familiar with the work to be performed and the hazards involved.

5.3.1 Authorized Person

After the completion of work on an energized system or equipment, the authorized person must remove from the work area any temporary personnel protection equipment and reinstall all covers and barriers.

5.3.2 Working with Energized Equipment connected to High- Voltage

Only qualified persons may work on electric circuit parts or equipment connected to high-voltage and that have not been deenergized. Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools. Workers that are have accumulated enough training and are still in training can also work on energized equipment with the supervision/instruction of a qualified and experienced electrical worker.

A qualified person or a worker that accumulated enough training and is still in training will be near any worksite where work on exposed energized circuits and equipment is being done in order to:

- observe the operation and give the warning to prevent an accident, as well as to
- assist immediate service in the event of an accident.

5.3.3 Prior Job Briefings

A job briefing should be held before starting each job and include all employees involved. The briefing should cover hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

5.3.4 Type of Hazards

The degree of hazard associated with electrical shock is a function of the duration, magnitude, and frequency of the current passed by the portion of the body incorporated in the circuit. The current that can flow through the human body with contacts at the extremities, such as between the hand or head and one or both feet, depends largely on the voltage. Body circuit resistance, even with liquid contacts (barring broken skin) will probably be not less than 500 ohms. The current flow at this resistance at 120 volts is 240 milliamperes. Recognition of the hazards associated with various types of electrical equipment is of paramount importance in developing and applying safety guidelines for working on energized equipment. Three classes (in order of increasing severity) of electrical hazards have evolved.

5.3.5 Class A Hazard

Class A electrical hazard exists when all the following conditions prevail: The primary AC potential does not exceed 130 volts rms. The available primary AC current is limited to 30 amperes rms. The stored energy available in a capacitor or inductor is less than 5 joules (J=CV2/2=LI2/2). The DC or secondary AC potentials are less than 50 volts' line- to-line and/or to ground or the DC or secondary AC power is 150 volt-amperes (V-A) or less. Although the voltages and currents may be considered nominal, a "Class A" electrical hazard is potentially lethal. This class is particularly dangerous because of everyday familiarity with such sources, an assumed ability to cope with them, and their common occurrence in less guarded exposures.

5.3.6 Class B Hazard

A Class B electrical hazard has the same conditions as a Class A hazard except that the primary AC potential is greater than 130 volts rms, but does not exceed 300 volts rms.

5.3.7 Class C Hazard

Class C electrical hazard classifications prevail for all situations when one or more of the limitations set in Class B are exceeded.

5.3.8 Employee Attitude

The attitudes and habits of personnel and the precautions they routinely take when working on energized equipment are extremely important. There are three modes of working on electrical equipment.

5.3.9 Mode 1: Turn Off the Power

All operations are to be conducted with the equipment in a positively de-energized state. All external sources of electrical energy must be disconnected by some positive action (e.g., locked-out breaker) and with all internal energy sources rendered safe. "Mode 1" is a minimum hazard situation.

5.3.10 Mode 2: Latent Danger

All manipulative operations (such as making connections or alterations to or near normally energized components) are to be conducted with the equipment in the positively de-energized state. Measurements and observations of equipment functions may then be conducted with the equipment energized and with normal protective barriers removed. "Mode 2" is a moderate-to-severe hazard situation, depending on the operating voltages and energy capabilities of the equipment.

5.3.11 Mode 3: Hot Wiring

"Mode 3" exists when manipulative, measurement, and observational operations are to be conducted with the equipment fully energized and with the normal protective barriers removed. "Mode 3" is a severe hazard situation that should be permitted only when fully justified and should be conducted under the closest supervision and control. One knowledgeable person should be involved in addition to the worker(s). Written permission may be required. Work on Class B or Class C energized circuitry must only be done when it is absolutely necessary.

5.3.12 Initial Inspections, Tests, or Determinations

Employees shall be instructed by Company Safety Officer CSO to inspect each safety device, tool, or piece of equipment. Visual inspections shall be made of the equipment and tools to determine that it is in good condition each day the equipment is to be used. All equipment and tools will be periodically inspected, maintained and tested.

Existing conditions shall be determined before starting work, by an inspection or a test. Such conditions shall include, but not be limited to, energized lines and equipment, safety devices,

conditions of poles, and the location of circuits and equipment, including power and communication lines, CATV and fire alarm circuits.

Electric equipment and lines shall be considered energized until determined to be deenergized by tests or other appropriate methods or means.
Operating voltage of equipment and lines shall be determined before working on or near energized parts.
All live-line tools shall be visually inspected before use each day. Tools to be used shall be wiped clean and if any hazardous defects are indicated such tools shall be removed from service.

Any equipment or tools that are observed to be defective in the course of their use or when periodically inspected or tested shall be immediately removed from service and labeled 'Defective Equipment – DO NOT USE' or disposed of.

5.3.13 Safe Access

All locations where work is to be performed shall be safely accessible for employees and subcontractors.

5.3.14 Elevated Locations

Any person working on electrical equipment on a crane or other elevated location must take necessary precautions to prevent a fall from reaction to electrical shock or other causes. A second person, knowledgeable as a safety watch, must assume the best possible position to assist the worker in case of an accident.

5.4 Overhead Lines

When working on or with overhead lines, the provisions of this section shall be complied with in addition to other applicable provisions of this subpart.

Prior to climbing poles, ladders, scaffolds, or other elevated structures, an inspection shall be made to determine that the structures are capable of sustaining the additional or unbalanced stresses to which they will be subjected.

Where poles or structures may be unsafe for climbing, they shall not be climbed until made safe by guying, bracing, or other adequate means.

Before installing or removing the wire or cable, strains to which poles and structures will be subjected shall be considered, and necessary action is taken to prevent failure of supporting structures.

When setting, moving, or removing poles using cranes, derricks, gin poles, A-frames, or other mechanized equipment near energized lines or equipment, precautions shall be taken to avoid contact with energized lines or equipment, except in bare-hand live-line work, or where barriers or protective devices are used.

Unless using suitable protective equipment for the voltage involved, employees standing on the ground shall avoid contacting equipment or machinery working adjacent to energized lines or equipment.

When approaching, leaving, or bonding to an energized circuit the minimum distances in Table V-2 shall be maintained between all parts of the insulated boom assembly and any grounded parts (including the lower arm or portions of the truck).

When positioning the bucket alongside an energized bushing or insulator string, the minimum line-to-ground clearances of Table V-2 must be maintained between all parts of the bucket and the grounded end of the bushing or insulator string. The use of handlines between buckets, booms, and the ground is prohibited. No conductive materials over 36 inches long shall be placed in the bucket, except for appropriate jumpers, armor rods, and tools.

Nonconductive-type handlines may be used from line to ground when not supported from the bucket. The bucket and upper insulated boom shall not be overstressed by attempting to lift or support weights in excess of the manufacturer's rating.

A minimum clearance table (as shown in Table V-2) shall be printed on a plate of durable nonconductive material and mounted in the buckets or its vicinity so as to be visible to the operator of the boom. It is recommended that insulated measuring sticks be used to verify clearance distances. Operation closer than the minimum clearance distance is prohibited.

TABLE V-2 - MINIMUM CLEARANCE DISTANCES FOR LIVE-LINE BARE-HAND WORK (ALTERNATING CURRENT)

Voltage range (phase to phase) kilovolts	Distance in feet and inches for maximum voltage	
	Phase to ground	Phase to phase
2.1 to 15	2'0"	2'0"
15.1 to 35	2'4"	2'4"
35.1 to 46	2'6"	2'6"
46.1 to 72.5	3'0"	3'0"
72.6 to 121.	3'4"	4'6"
138 to 145	3'6"	5'0"
161 to 169	3'8"	5'6"
230 to 242	5'0"	8'4"
345 to 362	(1)7'0"	(1)13'4"
500 to 552	(1)11'0"	(1)20'0"
700 to 765	(1)15'0"	(1)31'0"

Footnote (1) For 345-362kv., 500-552kv., and 700-765kv., the minimum clearance distance may be reduced provided the distances are not made less than the shortest distance between the energized part and the grounded surface.

Lifting equipment shall be bonded to an effective ground, or it shall be considered energized and barricaded when utilized near energized equipment or lines. Pole holes shall not be left unattended or unguarded in areas where employees are currently working. Tag lines shall be of a nonconductive type when used near energized lines.

5.4.1 Working Near Overhead Lines

If work is to be performed near overhead lines, the lines shall be deenergized and grounded, or other protective measures shall be provided before work is started such as having safeguards in place. If the lines are to be deenergized, arrangements shall be made with the person or organization that operates or controls the electric circuits involved to de-energize and ground

them. If protective measures, such as guarding, isolating, or insulating, are provided, these precautions shall prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

Note Reference: The work practices used by qualified persons installing insulating devices on overhead power transmission or distribution lines are covered by 1910.269 of this Part, not by 1910.332 through 1910.335 of this Part. Unqualified persons are prohibited from performing this type of work.

5.4.2 Unqualified Persons

When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

- Minimum approach distance to energized high power voltages lines for unqualified employees is 10 feet.
- Minimum approach distance for qualified employees shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified – Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Employees – Alternating Current). Approach distances are 10' for 50kV plus 4" for every additional 10kV.

TABLE S–5 APPROACH DISTANCES FOR QUALIFIED EMPLOYEES—ALTERNATING CURRENT

Table S-5	
Voltage Range AC (Phase to Phase	**Minimum Approach Distance**
300V and less	**Avoid Contact**
Over 300V, not over 750V	**1 ft. 0 inches**
Over 750V, not over 2kV	**1 ft. 6 inches**
Over 2kV, not over 15kV	**2 ft. 0 inches**
Over 15kV, not over 37kV	**3 ft. 0 inches**
Over 37kV, not over 87.5kV	**3 ft. 6 inches**
Over 87.5kV, not over 121kV	**4 ft. 0 inches**
Over 121kV, not over 140kV	**4 ft. 6 inches**

5.5 Vehicular and Mechanical Equipment

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10cm) for every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

∞ If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.

∞ If insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded, and are not a part of or an attachment to the vehicle or its

raised structure. The clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

∞ If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in Table S-5.

5.5.1 Derrick Trucks, Cranes, and Other Lifting Equipment

Appropriate warning signs shall be promptly placed and maintained in plain view of the operator and driver on all derrick trucks, cranes and other lifting equipment. The sign will read legibly at 12 feet; Unlawful to Operate this Equipment within 10 Feet of High Voltage Lines of 50 kV or less.

a. All derrick trucks, cranes and other lifting equipment shall comply with sections that cover this part, except:

- For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet,
- For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inches for each 1 kV. over 50 kV., or

b. Twice the length of the line insulator, but never less than 10 feet; for clearances in this subpart see Table V-1) and Derrick truck (electric line trucks) shall not be required to comply with:

- Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.
- The employer shall comply with Power Crane and Shovel Association Mobile Hydraulic Crane Standard No. 2.

All crawler, truck, or locomotive cranes in use shall meet the applicable requirements for design, inspection, construction, testing, maintenance operation as prescribed in the ANSI B30.5-1968, Safety Code for Crawler, Locomotive, and Truck Cranes.

However, the written, dated, and signed inspection reports and records of the monthly inspection of critical items prescribed in section 5-2.1.5 of the ANSI B30.5-1968 standard are not required. Instead, the employer shall prepare a certification record which includes the date the crane items were inspected; the signature of the person who inspected the crane items; and a serial number, or another identifier, for the crane, inspected. The most recent certification record shall be maintained on file until a new one is prepared.

5.5.2 Derricks

All derricks in use shall meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation as prescribed in American National Standards Institute B30.6- 1969, Safety Code for Derricks.

c. With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the stated clearance unless:

- An insulated barrier is installed between the energized part and the mechanical equipment, or
- The mechanical equipment is grounded, or
- The mechanical equipment is insulated, or
- The mechanical equipment is considered as energized.

5.6 Proper Illumination of Work Areas

Robinson Brothers Construction, Inc. employees shall not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

5.6.1 Limited Approach Boundary/Minimum Working Distance

When performing work with live line tools, minimum clear distances shall be maintained. Conductor support tools, such as link sticks, strain carriers, and insulator cradles, shall be permitted to be used provided that the clear insulation is at least as long as the insulator string or the minimum distance specified for the operating voltage.

The limited approach boundary is intended to keep unqualified persons away from an area where they may be exposed to live parts and will have a physical barrier (such as a chain or rope) and will prevent inadvertent entry into the work area. The boundary shall be posted with appropriate warning signs to alert qualified personnel to the hazards.

If unqualified persons are working near or at the limited approach boundary, they must be informed of the electrical hazard and warned to stay out and keep any conductive tools they may be using outside the boundary. If for some reason an unqualified person must enter the limited approach boundary, then s/he must be escorted by a qualified person at all times.

The distance of the limited approach boundary from any exposed live part is determined by using Table 130.2(C). There are two columns for the distances that make up the limited approach boundary: the first applies to movable conductors such as cables and the second applies to fixed parts such as panel-mounted conductors.

Table 130.2(C): Approach Boundaries to Live Parts for Shock Protection (all dimensions are the distance from live part to the employee).

Approach Boundaries to Live Parts for Shock Protection				
(1)	**(2)**	**(3)**	**(4)**	**(5)**
	Limited Approach Boundary[1]		**Restricted Approach**	
Nominal System Voltage	**Exposed Movable**	**Exposed Fixed**	**Inadvertent[1]; Includes**	**Prohibited Approach**
Range, Phase to Phase	**Conductor**	**Circuit Part**	**Adder**	**Boundary[1]**
Less than 50	Not specified	Not specified	Not specified	Not specified
50 to 300	3.05 m (10 ft. 0 in.)	1.07 m (3 ft. 6 in.)	Avoid contact	Avoid contact
301 to 750	3.05 m (10 ft. 0 in.)	1.07 m (3 ft. 6 in.)	304.8 mm (1 ft. 0 in.)	25.4 mm (0 ft. 1 in.)
751 to 15 kV	3.05 m (10 ft. 0 in.)	1.53 m (5 ft. 0 in.)	660.4 mm (2 ft. 2 in.)	177.8 mm (0 ft. 7 in.)

15.1 kV to 36 kV	3.05 m (10 ft. 0 in.)	1.83 m (6 ft. 0 in.)	787.4 mm (2 ft. 7 in.)	254 mm (0 ft. 10 in.)
36.1 kV to 46 kV	3.05 m (10 ft. 0 in.)	2.44 m (8 ft. 0 in.)	838.2 mm (2 ft. 9 in.)	431.8 mm (1 ft. 5 in.)
46.1 kV to 72.5 kV	3.05 m (10 ft. 0 in.)	2.44 m (8 ft. 0 in.)	965.2 mm (3 ft. 2 in.)	635 mm (2 ft. 1 in.)
72.6 kV to 121 kV	3.25 m (10 ft. 8 in.)	2.44 m (8 ft. 0 in.)	991 mm (3 ft. 3 in.)	812.8 mm (2 ft. 8 in.)
138 kV to 145 kV	3.36 m (11 ft. 0 in.)	3.05 m (10 ft. 0 in.)	1.093 m (3 ft. 7 in.)	939.8 mm (3 ft. 1 in.)
161 kV to 169 kV	3.56 m (11 ft. 8 in.)	3.56 m (11 ft. 8 in.)	1.22 m (4 ft. 0 in.)	1.07 m (3 ft. 6 in.)
230 kV to 242 kV	3.97 m (13 ft. 0 in.)	3.97 m (13 ft. 0 in.)	1.6 m (5 ft. 3 in.)	1.45 m (4 ft. 9 in.)
345 kV to 362 kV	4.68 m (15 ft. 4 in.)	4.68 m (15 ft. 4 in.)	2.59 m (8 ft. 6 in.)	2.44 m (8 ft. 0 in.)
500 kV to 550 kV	5.8 m (19 ft. 0 in.)	5.8 m (19 ft. 0 in.)	3.43 m (11 ft. 3 in.)	3.28 m (10 ft. 9 in.)
765 kV to 800 kV	7.24 m (23 ft. 9 in.)	7.24 m (23 ft. 9 in.)	4.55 m (14 ft. 11 in.)	4.4 m (14 ft. 5 in.)

The minimum working distance and minimum clear hot stick distances stated in Table V-1 shall not be violated. The minimum clear hot stick distance is that for the use of live- line tools held by linemen when performing live-line work.

Conductor support tools, such as link sticks, strain carriers, and insulator cradles, may be used:

- Provided, that the clear insulation is at least as long as the insulator string or the minimum distance specified in Table V-1 for the operating voltage.

TABLE V-1 - ALTERNATING CURRENT -MINIMUM DISTANCES

Voltage Range (phase to phase) Hot (Kilovolt)	Minimum working and Clear Stick Distance
2.1 to 15	2 ft. 0 in.
15.1 to 35	2 ft. 4 in.
35.1 to 46	2 ft. 6 in.
46.1 to 72.5	3 ft. 0 in.
72.6 to 121	3 ft. 4 in.
138 to 145	3 ft. 6 in.
161 to 169	3 ft. 8 in.
230 to 242	5 ft. 0 in.
345 to 362	(1)7 ft. 0 in.
500 to 552	(1)11 ft. 0 in.
700 to 765	(1)15 ft. 0 in.

Footnote(1) **NOTE:** For 345-362 kv., 500-552 kv., and 700-765 kv., minimum clear hot stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and the grounded surface.

5.7 Chain of Command

The supervisory chain must be identified for normal operation and development, servicing, or testing of hazardous equipment. An up-to-date set of instructions for operation, maintenance, testing, and safety should be provided and made readily available to anyone working on hazardous equipment.

As many tests, as practicable should be made on any type of electrical equipment in the unenergized condition, or at most, energized with reduced hazard. All covering, clothing, and jewelry that might

cause hazardous involvement must be removed. Adequate and workable lock-out/tag- out procedures must be employed.

A person in a hazardous position who appears to be fatigued, ill, emotionally disturbed, or under the influence of alcohol and/or drugs (medicinal, or otherwise) must be replaced by a competent backup person, or the hazardous work must be terminated. Supervisors and workers must be encouraged to make the conservative choice when they are in doubt about a situation regarding safety.

Training sessions and drills must be conducted periodically to help prevent accidents and to train personnel to cope with any accidents that may occur.

CPR instruction must be included. An emergency-OFF switch clearly identified and within easy reach of all high-hazard equipment, should be provided. Also, this switch may be used to initiate a call for help. Resetting an Emergency-OFF switch must not be automatic but must require an easily understandable overt act. Automatic safety interlocks must be provided for all access to high-hazard equipment. Any bypass of such an interlock should have an automatic reset, display conspicuously the condition of the interlocks, and ensure that barriers cannot be closed without enabling the interlock.

All equipment should have convenient, comfortable, and dry access. Communication equipment (e.g., fire alarm box, telephone) should be provided near any hazardous equipment. Its location should be clearly marked to ensure that the person requesting assistance can direct the people responding to a call for help to the emergency site quickly.

Any component that in its common use is non-hazardous, but in its actual use may be hazardous, must be distinctively colored and/or labeled. (An example might be a copper pipe carrying high voltage or high current.) Periodic tests of interlocks to ensure operability must be performed and documented at least yearly.

5.8 Protective Systems

Equipment must be designed and constructed to provide personnel protection. First-line and backup safeguards should be provided to prevent personnel access to energized circuits. Periodic tests must be established to verify that these protective systems are operative.

5.9 Safety Practices

All electrical systems and equipment shall be treated as energized until tested or proven de-energized. Additional safety practices are described below.

a. Cable Clamping:

A suitable mechanical-strain-relief device such as a cord grip, cable clamp, or plug must be used for any wire or cable penetrating an enclosure where external movement or force can exert stress on the internal connection. Grommets or similar devices must not be used as a strain relief.

b. Emergency Lighting:

There must be an emergency lighting system that activates when normal power fails in Class C conditions.

c. Flammable and Toxic Material Control:

The use of flammable or toxic material must be kept to a minimum. When components with such fluids are used, a catch basin or other approved method must be provided to prevent the spread of these materials should the normal component case fail.

d. Isolation:

All sources of dangerous voltage and current must be isolated by covers and enclosures. Access to lethal circuits must be either via screw-on panels, each containing no less than four screws or bolts, or by interlocked doors. The frame or chassis of the enclosure must be connected to a good electrical ground with a conductor capable of handling any potential fault current.

e. Lighting:

Adequate lighting must be provided for easy visual inspection.

f. Overload Protection:

Overload protection and well marked disconnects must be provided. Local "off" controls must be provided on remote-controlled equipment. All disconnects and breakers should be clearly labeled as to which loads they control.

g. Power:

All AC and DC power cabling to equipment not having a separate external ground but having wire-to-wire or wire-to-ground voltage of 50 volts or more must carry a ground conductor unless cabling is inside an interlocked enclosure, rack, grounded wire way, or conduit, or feeds a commercial double-insulated or UL-approved device. This requirement will ensure that loads such as portable test equipment, temporary or experimental, is grounded. UL-approved devices such as coffeepots, timers, etc., used per the manufacturer's original intent are permissible.

h. Rating:

All conductors, switches, resistors, etc., should be operated within their design capabilities. Pulsed equipment must not exceed the average, the rms, or the peak rating of components. The equipment should be de-rated as necessary for the environment and the application of the components.

i. Safety Grounding:

Automatic discharge devices must be used on equipment with stored energy of 5 joules or more. Suitable and visible manual grounding devices must also be provided to short-to-ground all dangerous equipment while work is being performed. The following checklist must be used as a guide for circuits operating at 130 volts or more or storing more than 5 joules. An enclosure may be a room, a barricaded area, or an equipment cabinet.

j. Access:

Easily opened doors, panels, etc., must be interlocked so that the act of opening de-energizes the circuit. Automatic discharge of stored-energy devices must be provided. Doors should be key-locked, with the same required key being also used for the locks in the control-circuit-interlock chain. This key must be removable from the door only when the door is closed and locked.

k. Heat:

Heat-generating components, such as resistors, must be mounted so that heat is safely dissipated and does not affect adjacent components.

l. Isolation:

The enclosure must physically prevent contact with live circuits. The enclosure can be constructed of conductive or non-conductive material. If conductive, the material must be electrically interconnected and connected to a good electrical ground. These connections must be adequate to carry all potential fault currents.

m. Seismic Safety:

All racks, cabinets, chassis and auxiliary equipment must be secured against movement during earthquakes.

n. Strength:

Enclosures must be strong enough to contain flying debris due to component failure.

o. Temporary Enclosure:

Temporary enclosures (less than 6-month duration) not conforming to the normal requirements must be considered Class C hazards.
Ventilation: Ventilation must be adequate to prevent overheating of equipment and to purge toxic fumes produced by a fault.

p. Visibility:

Enclosures large enough to be occupied by personnel must allow exterior observation of equipment and personnel working inside the enclosure.

q. Warning Indicators:

When systems other than conventional facilities represent Class C hazards, the systems should be provided with one of the following two safety measures:

1) A conspicuous visual indicator that is clearly visible from any point where a person might make hazardous contact or entry, and

2) A clearly visible primary circuit breaker or "OFF" control button on the front of the enclosure.

Because a wide range of power supplies exist, no one set of considerations can be applied to all cases. The following classification scheme may be helpful in assessing power-supply hazards.

Power supplies of 50 volts or less with high current capability too often are not considered a shock hazard, although these voltages are capable of producing fatal shocks. Since they are not "high voltage," such power sources frequently are not treated with proper respect. In addition to the obvious shock and burn hazards, there is also the likelihood of injuries incurred in trying to get away from the source of a shock. Cuts or bruises and even serious and sometimes fatal falls have resulted from otherwise insignificant shocks.

Power supplies of 300 volts or more, with lethal current capability, have the same hazards to an even greater degree. Because supplies in this category are considered Class C hazards, they must be treated accordingly. High-voltage supplies that do not have dangerous current capabilities are not serious shock or burn hazards in themselves and are therefore often treated in a casual manner.

However, they are frequently used adjacent to lower-voltage lethal circuits, and a minor shock could cause a rebound into such a circuit. Also, an involuntary reaction to a minor shock could cause a serious fall (for example, from a ladder or from experimental apparatus).

The following are additional safety considerations for power supplies:

Primary disconnect - A means of positively disconnecting the input must be provided. This disconnect must be clearly marked and located where the workmen can easily lock or tag it out while servicing the power supply. If provided with a lockout device, the key must not be removable unless the switch or breaker is in the 'off' position.

Overload Protection - Overload protection must be provided on the input and should be provided on the output.

5.10 Danger with Large Capacitors

This section describes the hazards associated with capacitors capable of storing more than 5 joules of energy. Capacitors may store hazardous energy even after the equipment has been de-energized and may build up a dangerous residual charge without an external source; “grounding” capacitors in series, for example, may transfer rather than discharge the stored energy. Another capacitor hazard exists when a capacitor is subjected to high currents that may cause heating and explosion.

At one time, capacitors were called condensers, and older capacitors may still bear this label in diagrams and notices. Capacitors may be used to store large amounts of energy. An internal failure of one capacitor in a bank frequently results in an explosion when all other capacitors in the bank discharge into the fault. Approximately 10 sups 4 joules are the threshold energy for explosive failure of metal cans.

Because high-voltage cables have capacitance and thus can store energy, they should be treated as capacitors. The liquid dielectric in many capacitors, or its combustion products, may be toxic. Do not breathe the fumes from the oil in older capacitors. The following are safety practices for capacitors:

a. Automatic Discharge

Permanently connected bleeder resistors should be used when practical. Capacitors in series should have separate bleeders. Automatic shorting devices that operate when the equipment is de-energized or the enclosure is opened should be used. The time required for a capacitor to discharge to safe voltage (50 volts or less) must not be greater than the time needed for personnel to gain access to the voltage terminals never longer than 5 minutes.

In the case of Class C equipment with stored energy in excess of 5 joules, an automatic, mechanical discharging device must be provided that functions when normal access ports are opened. This device must be contained locally within protective barrier to ensure wiring integrity and should be in plain view of the person entering the protective barrier so that the individual can verify its proper functioning. Protection also must be provided against the hazard of the discharge itself.

b. Safety Grounding:

Fully visible, manual-grounding devices must be provided to render the capacitors safe while they are being worked on. Grounding points must be clearly marked, and caution must be used to prevent transferring charges to other capacitors.

c. Ground Hooks

All ground hooks must:

- Have conductors crimped and soldered.
- Be connected such that impedance is less than 0.1 ohms to ground.
- Have the cable conductor clearly visible through its insulation.
- Have a cable conductor size of at least #2 extra flexible, or in special conditions a conductor capable of carrying any potential current.
- Be in sufficient number to ground conveniently and adequately ALL designated points.
- Be grounded and located at normal entry way when stored, in such a manner to ensure that they are used.

In Class C equipment with stored energy in excess of 5 joules, a discharge point with an impedance capable of limiting the current to 500 amperes or less should be provided.

1) This discharge point must be identified with a yellow circular marker with a red slash and must be labeled 'HI Z PT" in large readable letters.
2) A properly installed grounding hook must first be connected to the current-limiting discharge point and then to a low-impedance discharge point (less than 0.1 ohms) that is identified by a yellow circular marker.
3) The grounding hooks must be left on all of these low impedance points during the time of safe access. The low-impedance points must be provided, whether or not the HI-Z current-limiting points are needed. Voltage indicators that are visible from all normal entry points should also be provided.

a. Fusing:

Capacitors used in parallel should be individually fused when possible to prevent the stored energy from dumping into a faulted capacitor. Care must be taken in placement of automatic-discharge safety devices with respect to fuses. If the discharge flows through the fuses, a prominent warning sign must be placed at each entry indicating that each capacitor must be manually grounded before work can begin. Special knowledge is required for high- voltage and high-energy fusing.

5.10.1 Unused Terminal Shorting:

Terminals of all unused capacitors representing a Class C hazard or capable of storing 5 joules or more must be visibly shorted.

5.11 Danger with Large Magnets

This section describes inductors and magnets that can store more than 5 joules of energy or that operate at 130 volts or more. The following are some hazards peculiar to inductors and magnets:

- The ability of an inductor to release stored energy at a much higher voltage than that used to charge it.
- Stray magnetic fields that attract magnetic materials.

- Time-varying stray fields that induce eddy currents in conductive material thereby causing heating and mechanical stress.
- Time-varying magnetic fields that may induce unwanted voltages at inductor or magnet terminals.

The following are safety practices for inductive circuits:

a. Automatic Discharge:

Freewheeling diodes, varistors, thyristors, or other automatic shorting devices must be used to provide a current path when excitation is interrupted.

b. Connections:

Particular attention should be given to inductors and magnets are liquid cooled. The unit should be protected by thermal interlocks on the outlet of each parallel coolant path, and a flow interlock should be included for each device.

c. Eddy Currents:

Units with pulsed or varying fields should have a minimum of eddy-current circuits. If large eddy-current circuits are unavoidable, they should be mechanically secure and able to safely dissipate any heat produced.

d. Grounding:

The frames and cores of magnets, transformers, and inductors should be grounded. Rotating

e. Electrical Machinery:

Beware of the hazard due to residual voltages that exist until rotating electrical equipment comes to a full stop.

5.12 Safety Design

Proper philosophy is vital to the safe design of most control applications. The following checklist should be used as a guide.

a. Checkout:

Interlock chains must be checked for proper operation after installation, after any modification, and during periodic routine testing.

b. Fail-safe design:

All control circuits must be designed to be 'fail-safe.' Starting with a breaker or fuse, the circuit should go through all the interlocks in series to momentary on-off switches that energize and 'seal in' a control relay. Any open circuit or short circuit will de-energize the control circuit and must be reset by an overt act.

c. Interlock Bypass Safeguards

A systematic procedure for temporarily bypassing interlocks must be established. Follow-up procedures should be included to ensure removal of the bypass as soon as possible. When many control-circuit points are available at one location, the bypassing should be made through the

normally open contacts of relays provided for this purpose. In an emergency, these relays can be opened from a remote-control area.

d. Isolation:

Control power must be isolated from higher power circuits by transformers, contactors, or other means. Control power should be not more than 120 volts, AC, or DC. All circuits should use the same phase or polarity so that no additive voltages (Class B or Class C hazard) are present between control circuits or in any interconnect system. Control-circuit currents should not exceed 5 amperes.

e. Lock-Out:

A keyed switch should be used in interlock chains to provide positive control of circuit use. To ensure power removal before anyone enters the enclosure, this same key should also be used to gain access to the controlled equipment. Motor Control Circuits (Class B or Class C Hazards). All Class B or Class C motor circuits must have a positive disconnect within view of the motor or, if this is not practical, a disconnect that can be locked open by the person working on these motor circuits is acceptable.

f. Overvoltage Protection:

Control and instrumentation circuits used with high-voltage equipment must have provision for shorting fault-induced high voltages to ground. High-voltage fuses with a high-current, low-voltage spark gap downstream from the high-voltage source are recommended. This also applies to all circuits penetrating high-voltage enclosures.

g. Voltage Divider Protection:

The output of voltage dividers used with high voltages must be protected from overvoltage-to-ground within the high-voltage area by spark gaps, neon bulbs, or other appropriate means.

h. Current Monitors:

Currents should be measured with a shunt that has one side grounded or with current transformers that must be either loaded or shorted at all times.

5.12.1 Instrument Accuracy:

Instrumentation should be checked for function and calibration on a routine basis.

5.13 Radiation Hazards

This section covers radiation hazards that may be encountered in working with electrical equipment. The following information should be used as a rough guide to radiation safety. Hazardous electromagnetic radiation must be isolated in shielded enclosures.

Transmission paths of microwave energy must be enclosed or barricaded and well- marked. Care must be taken to avoid reflecting energy out of this path. Suitable goggles must be worn where exposure is possible. Dose rates must not exceed those shown below.

a. Monitoring:

When equipment capable of generating radiation, hazard is used, monitoring must be provided to detect and measure the radiation. Where personnel may be exposed, this monitoring equipment should be arranged to de- energize the generating equipment at a safe preset level.

b. Isolation:

Equipment that produces x-rays (high-voltage vacuum tubes operating at more than 15,000 volts) or any equipment that under fault conditions could produce x-rays (e.g., spectrometers) must be isolated from personnel. This isolation may be by distance or by lead shielding.

For any questions, call the CSO. High-power sources of ultraviolet, infrared, and visible light must be isolated by barriers that are opaque to the radiation. When a beam of this radiation is projected out of an enclosure, the beam path must be barricaded and well marked. Care must be taken to eliminate reflective surfaces along the beam path. Suitable goggles must be worn where exposure is possible.

5.14 More Than 300 Volts

To work on systems with voltages greater than 300 volts (CLASS B OR C HAZARD):

- Open the feeder breaker,
- Roll out if possible,
- Tag out, and lock if in enclosure.

If work is on circuits of 600 V or more, positive grounding cables should be attached to all three phases. The tag should contain who, why, and when information, it is of vital importance because a person's life may depend on it. "Vital" in this case means that the presence and status of the tag are inviolate, and the tag must not be altered or removed except by the person who attached it.

5.15 Less than 300 Volts

To work on systems with voltages less than 300 volts (CLASS A HAZARD):

- Turn-off and tag the feeder breaker.
- The tag is inviolate except on projects where established circuit checkout procedure allows a qualified person to remove it and energize circuit after checkout is complete.

5.16 High Voltage

To work on high voltage power supplies and enclosures use Class B or Class C hazard procedure specified in the safety requirements. Access should always be by a permissive key that interrupts input power when the key is removed from control panel. The grounding of power supply output must occur either automatically when the key is removed from the control panel or manually before access door can be opened.

5.17 High Current

To work on high current power supplies (normally for magnets), treat system as a high voltage power supply, if energy storage is 5 joules or more when the system is off. If not, then requirements for working on magnet are as follows:

- If the power supply is equipped with Kirk (trademark) or equivalent interlock,

- turn key and remove.

This locks the input breaker in 'off' position until the key is reinserted and turned. If the power supply is not equipped with a Kirk (trademark) or equivalent interlock, turn off and tag input circuit breaker.

5.18 Motor Generator Systems

For motor or generator work, primary feeder breaker must be opened, tagged, and locked out if possible. For generator-load work, motor-start permissive key must be removed by the person doing work and restored when work is complete.

5.19 Working on Power Supplies

The minimum requirements for working on any power supply are to turn the power off and properly tag feeder circuit breaker external to the power supply.

5.20 Electrical Lock-out/Tag-out Procedures

When you have to do maintenance work on a machine, take these four steps to protect yourself and your co-workers from injury:

1) De-energize the machine if possible. Positively disconnect the machine from the power source. If there is more than one source of power, then disconnect them all.

2) If possible, lock out all disconnect switches. You must be given a lock and a key for each disconnect before you begin working on the machine.

3) Tag all disconnect switches. Use the yellow or Red safety tags which state in large letters --'Danger...Do Not Operate,' or 'Danger...Do Not Energize' and which give the name of the individual who locked out the equipment, date and time. The tag must also state 'DO NOT REMOVE THIS TAG.' (The person who placed the tag may remove it only after the machinery maintenance has been completed.)

Figure 1: Red "DO NOT OPERATE" Tag

4) Test the equipment to ensure it is de-energized before working on it. First, attempt to operate the equipment by turning it on normally. Next, check all electrical lines and exposed areas with test equipment or a 'lamp.' Finally, short to ground any exposed connections using insulated grounding sticks. This test must be done even if the electrical connection is physically broken, such as pulling out a plug, because of the chance of discharging components.

5) A TAG OUT ONLY PROCEDURE MAY BE USED IF THE MACHINE CANNOT BE LOCKED OUT. IF THE MACHINE IS SUPPLIED ELECTRICAL POWER FROM A SINGLE SOURCE, WHICH IS UNDER THE EXCLUSIVE CONTROL OF A TRAINED AND QUALIFIED REPAIR PERSON AT ALL TIMES AND THERE ARE NOT ANY OTHER PERSONS IN THE REPAIR AREA WHO COULD BE HARMED BY THE ACCIDENTAL ENERGIZING OF THE MACHINERY, THEN TAG OUT MAY BE USED INSTEAD OF LOCK-OUT/TAG OUT.

Be aware that many accidents occur at the moment of re-energizing. If the machinery is to be re-under the immediate and direct commands of the original lock-out/tag out person, or in the event of a shift change, or other unavailability of the original person, then the original shall, before leaving,

appoint a surrogate original person and show him or her all steps taken to lock-out/tag out the equipment.

5.21 Arc Flash and Electrical Safety

An arc flash is the explosive release of energy that occurs when there is a phase-to-phase or phase to ground arc fault. The arc fault may be the result of unsafe work procedures such as a dropped tool or accidental contact by a human. Additionally, an arc fault may be caused by corrosion' insulation failure' conductive dust' and contact by animals.

During an arc flash,' the rapid heating of air molecules and the vaporization of conductive metals generate an intense pressure blast. This blast pressure can

propel shrapnel' tools and workers through the air. The heat wave generated by an arc flash may be severe enough to melt metal and severely burn a worker that is standing in the vicinity of the flash.

Workers that are exposed to an arc flash may sustain injuries typical to an explosion. Typical injuries encompass burns, loss of sight, loss o f hearing, broken bones, head injuries, and shrapnel injuries.

5.22 Applicable Codes And Standards

NFPA 70E covers the full range of electrical safety issues, including safety-related work practices, maintenance, special equipment requirements, and installation. It focuses on protecting people and identifies requirements that are considered necessary to provide a workplace that is free of electrical hazards.

OSHA bases its electrical safety mandates, found in Subpart S part 1910 and Subpart K part 1926, on the comprehensive information found in NFPA 70E. NFPA 70E is recognized as the tool that illustrates how an employer might comply with these OSHA standards. The relationship between the OSHA regulations and NFPA 70E can be described as OSHA is the “shall” and NFPA 70E the “how.”

OSHA mandates that all services to electrical equipment be done in a de-energized state. Working live can only be under special circumstances. If it is necessary to work live (>50 volts to ground), the regulations outlined in NFPA 70E, Article 130 should be used as a tool to comply with OSHA mandates Subpart S part 1910.333(a)(1).

NFPA 70E — The Safety related work practices as outlined in NFPA 70E and application tables will be followed and adhered to for the safety of all employees.

This standard outlines safety programs' calculations for the degree of hazard' personal protective equipment' worker training and warning labels for equipment.

5.23 IEEE 1584 - Arc Flash Hazard Analysis / Calculations

This article deals with calculating the size of the potential fault. These calculations provide a basis for the level of personal protective equipment (PPE) that is required when examining or servicing equipment.

5.24 Arc Flash and Enclosures

Article 110.16 of the National Electric Code (NEC) states that switchboards' panelboards' industrial control panels' meter socket enclosures' and motor marked so that qualified persons examining or

servicing the equipment know the potential hazards that exist. A couple of common field marking labels are found below in figures 5 and 6.

Since the NEC requires field marking of enclosures where arc flash hazards exist'. UL does not require an arc flash hazard marking for enclosures by the integrator or manufacturer of the equipment. It is the responsibility of the end user to determine the arc hazard that exists in respect to the power supply to the equipment and the specific components used in that equipment.

Once the arc flash hazard analysis has been completed for a specific piece of equipment' a flash protection boundary is established. This boundary is not based on a protective rating of the enclosure but rather the level of energy that an arc flash could produce. Any person that comes within this protection boundary must use personal protective equipment according to the level of fault that has been calculated. In general, NFPA 70E states that for low voltage applications (below 600V)' a 4-foot protection boundary must be observed.

5.25 Arc Flash and Busbar Systems

When designing a custom busbar power distribution system. It is important to ensure that the phases' neutral and ground busbars are properly spaced, and are braced to support a specific electrical short. Standardizing on a pre-tested bus- bar system can eliminate costly engineering and design work by providing safe and acceptable configurations for the set of pre-tested components.

5.26 Conclusions for Arc Flash Hazards

Arc flash hazard should be taken seriously. End users should perform a detailed hazard analysis, ' and proper safety measures must be taken to prevent injuries.

1) IEEE 1584 and NFPA 70E should be the guideline for flash hazard analysis and safety initiatives.
2) Enclosures must be a field labeled to warn of potential arc flash hazards. Empty enclosures do not require arc flash ratings or testing.
3) Pre-Tested Busbar systems should meet or exceed spacing and short-circuit bracing standards.

6.0 RECORDKEEPING

Recordkeeping requirements are included in Title 8 California Codes and Regulations (T8, CCR) for the purpose of establishing a historical record of compliance. These requirements include the following:

- OSHA Log 300.
- Lock-out/block-out activity records.
- Operation and maintenance activity records.
- Medical surveillance program and records.
- Training records.
- Inspection records.

a. Reports and notifications to Cal/OSHA must be made of the following incidents and activities:

- Serious injury or death. A report must be made immediately by telephone (within 8 hours) to a district office.

- Employers are allowed 24 hours if they can show that circumstances prevented the report from being made in 8 hours. 342(a)

Note: A serious injury or illness is defined as one that requires inpatient hospitalization for more than 24 hours of care other than medical observation or when an employee suffers a loss of a member of the body or a serious degree of permanent disfigurement. 330(h)

7.0 REFERENCES

1.	**Documents & External References** https://www.depts.ttu.edu/opmanual/OP60.14D.pdf, Subchapter 4. Construction Safety Orders Article 3. General, 1513. Housekeeping, http://www.dir.ca.gov/title8/1513.html, http://www.dir.ca.gov/dosh/dosh_publications/ConstGuideOnline.pdf,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to provide fall protection procedures to prevent injury to employees while performing work assignments at elevated levels in accordance with Cal/OSHA California Code of Regulations, Title 8, Section 1670 and related areas.

1.1 Scope

When work is performed on a non-owned or operated site, the operator's program shall take precedence. However, this document covers Robinson Brothers Construction, Inc. employees and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

TERM	DESCRIPTION
Anchorage	A secure point of attachment for lifelines, lanyards or deceleration devices.
Body Belt (Safety Belt)	A strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.
Body Harness	Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
Compliance with Guardrail Systems	A standard guardrail shall consist of top rail, mid-rail or equivalent protection, and posts and shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the floor, platform, runway, or ramp level.
Connector	A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
Deceleration Device	Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest or otherwise limit the energy imposed on an employee during fall arrest.
Deceleration Distance	The additional vertical distances a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
Equivalent	Alternative designs, materials, or methods to protect against a hazard which the

	employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
Free Fall	The act of falling before a personal fall arrest system begins to apply force to arrest the fall.
Free Fall Distance	The vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
Infeasible	That it is impossible to perform the inspection work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
Lanyard	A flexible line of rope, wire rope, or strap which has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
Leading Edge	The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
Lifeline	A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
Personal Fall Arrest System	A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
Positioning Device System	A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands-free while leaning.
Self-Retracting Lifeline/Lanyard	A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after the onset of a fall, automatically locks the drum and arrests the fall.
Snap-hook	A connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap-hooks are typically one of two types: (1) The locking type with a self-closing, self--locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or (2) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snap-hook as part of personal fall arrest systems and positioning device systems is prohibited.

2.1 Key Responsibilities

2.1.1 That Preparation of Fall Protection Program and Plans

Any changes to this Fall Protection Program must be approved by the Safety Manager, who is designated the *Qualified Person* to prepare plans for specified work sites. A qualified person is determined by the training received in fall protection planning and has demonstrated skills and knowledge in the preparation of fall programs, plans, and the hazards involved.

2.1.2 Supervisor

The Supervisor shall ensure that all persons assigned to work at elevated levels are protected by personal fall protection equipment.

- Supervisors shall make exposure determinations and shall discuss with their employees the extent to which scaffolds, ladders or vehicle mounted work platforms can be used.
- Ensure that fall protection equipment is available and in safe working condition.
- Provide for emergency rescue in the event of a fall. Pre-plan the job to ensure that employees are trained properly in the use, limitations, inspections and rescue procedures and that training records are on file.

2.1.3 Employees

Employees shall ensure they have and use the fall protection equipment as required by this program and:

- Understand the potential hazards of working at elevated levels as well as gaining access to and from the work location.
- Understand the use and limitations of such equipment.
- Pre-plan the job with his/her supervisor to agree that the job can be done safely.
- Inspect such equipment before each use and to report defective equipment immediately to their supervisor.

3.0 SAFETY

3.1 Rescue of an Employee in Case of a Fall

- Robinson Brothers Construction, Inc. shall provide for prompt rescue of employees in the event of a fall or shall assure the employees can rescue themselves.
- The pre-planning stage before the beginning of each elevated work assignment shall be evaluated by the supervisor to provide rescue of employees involved in a fall.

3.1.1 Fall Protection Plan Required and Procedures to Completing One

When a Fall Protection Plan is required only a qualified person shall develop the fall protection plan specifically for the site where the construction work is being performed, and the plan must be kept up to date.

The requirement for a competent person - the implementation of the fall protection plan shall be under the supervision of a competent person. The plan shall document the identity of the competent person.

This option is available only to employees engaged in leading edge work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan shall conform to the following provisions:

- The fall protection plan shall be prepared by a qualified supervisor and developed specifically for the site where the leading-edge work is being performed.
- The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.
- The fall protection plan shall identify each location where conventional fall Protection methods cannot be used.
- These locations shall then be classified as controlled access zones.

3.2 Controlled Access Zones and Safety Monitoring Systems

- When used to control access to areas where leading edge and other operations are taking place, the controlled access zone shall be defined by a control line or by any other means that restricts access.
- Signs shall be posted to warn unauthorized employees to stay out of the controlled access zone.
- Robinson Brothers Construction, Inc. shall designate a competent person to monitor the safety of other employees.
- When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge.
- The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.
- The control line shall be connected on each side to a guardrail system or wall.
- Control lines shall consist of ropes, wires, tapes, or equivalent materials.
- Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high- visibility material.
- Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m).
- Each line shall have a minimum breaking strength of 200 pounds.
- When the use of conventional fall protection equipment is deemed infeasible, or the use of this equipment creates a greater hazard a Fall Protection Plan which includes a safety monitoring system shall be implemented by the supervisor.

3.2.1 Competent Person

Supervisors shall designate a competent person to monitor the safety of other employees. The competent person shall be assigned to:

- Recognize fall hazards,
- Warn employees if they are unaware of fall hazard or are acting in an unsafe manner,

- Be on the same working surface and in visual contact of working employees,
- Stay close enough for verbal communication, and
- Not have other assignments that would take his/her attention from the monitoring function.

4.0 TRAINING

Pre-plan the job to ensure that employees have been properly trained in the use, limitations, inspections and rescue procedures and that training records are on file.

5.0 PROCEDURE

Fall protection shall be provided when Robinson Brothers Construction, Inc. employees are exposed to falls greater than 7 1/2 feet.

Approved personal fall arrest fall restraint or positioning systems shall be worn by those employees exposed to falling more than 7 1/2 feet from the perimeter of a structure. Also unprotected sides and edges, leading edges, through shaftways and openings, sloped roof surfaces steeper than 7:12, or other sloped surfaces steeper than 40 degrees. Under the provisions of (Cal/OSHA requirements).

Requirements that Personal Fall Arrest Systems shall comply with personal fall arrest systems, when stopping a fall, shall (all must be met):

- limit maximum arresting force on an employee to 1,800 pounds when used with a body harness;
- be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level, and, where practicable, the anchor end of the lanyard shall be secured at a level not lower than the employee's waist,
- bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet, and

have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

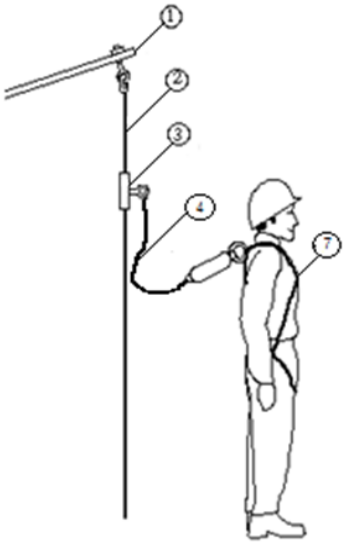
5.1 Minimum Standards

The following are minimum standards for Robinson Brothers Construction, Inc. employee personal fall protection systems:

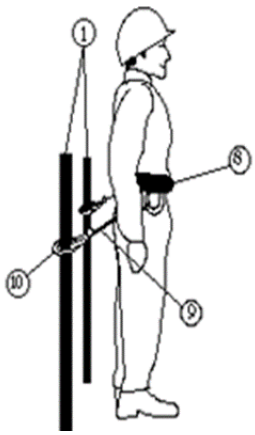
- All fall arresting, descent control, and rescue equipment shall be approved and used in accordance with the manufacturer's recommendations.
- All safety belts, harnesses, and lanyards placed in service shall be labeled as meeting the requirements contained in ANSI A10.14-1975. Requirements for Safety Belts, Harnesses, Lanyards, Lifelines and Drop Lines for Construction and Industrial use are to be in compliance with the requirement stated in Subsection (l).
- All D-rings must be a minimum of 21/4 inches (inside diameter).
- All snap hooks shall not allow pressure to be applied to the gate in the opening direction.
- No pelican hooks on lanyards should be used as a primary connection.
- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.

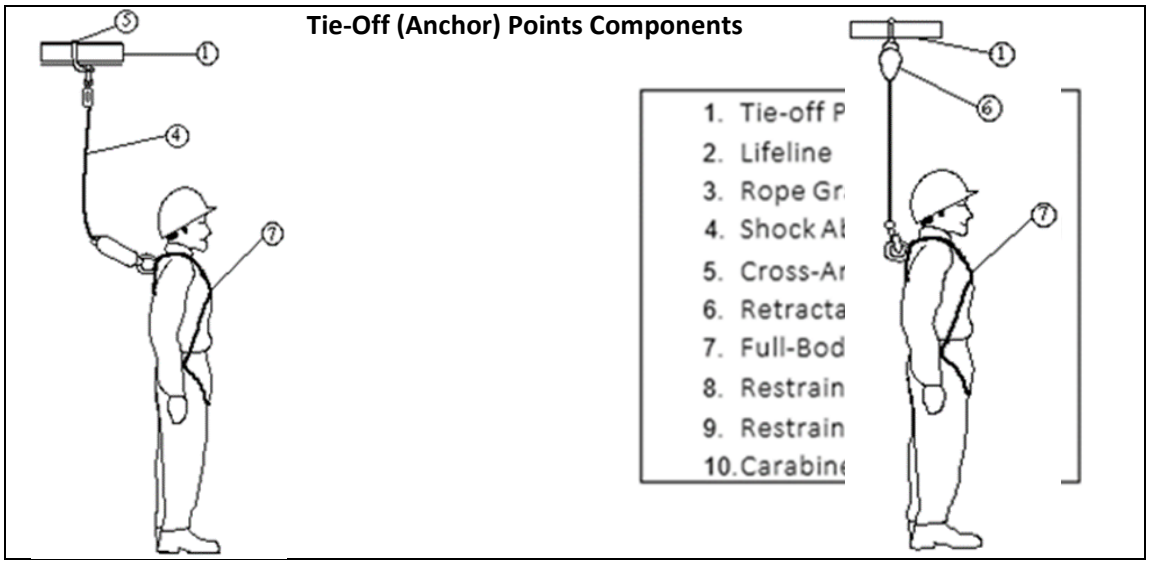
- Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds.
- D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snap-hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook. Only a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member shall be used.
- Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- All lifelines and anchorages shall be capable of supporting a minimum dead weight of 5,000 pounds.
- Lifelines shall be protected against being cut or abraded.
- Fall protection anchor points to be capable of 5000 lbs. per employee unless it is part of an engineered system. Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached. Alternatively, shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two and under the supervision of a qualified person.

Tie-Off (Anchor) Points Components



1. Tie-off Point
2. Lifeline
3. Rope Grab
4. Shock Absorbing Lanyard
5. Cross-Arm Strap
6. Retractable Lifeline
7. Full-Body Harness
8. Restraining Belt
9. Restraining Lanyard
10. Carabineer





5.1.1 Positioning Systems and Positioning Device

Requirements for positioning systems and positioning device systems and their use shall conform to the following provisions (all must be met):

- Positioning devices shall be rigged such that an employee cannot free fall more than 2 feet.
- Positioning device systems shall be inspected before each use for wear, damage, and other deterioration and defective components shall be removed from service.
- The use of non-locking snap-hooks shall be prohibited after January 1, 1998.
- Anchorage points for positioning device systems shall be capable of supporting two times the intended load or 3,000 pounds, whichever is greater.
- Systems used by an employee having a combined person and tool weight more than 310 pounds shall be modified to provide proper protection for such heavier loads.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head, except when climbing.
- Body harnesses and components shall be used only for employee protection and not to hoist materials.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
- Provide for prompt rescue of employees in the event of a fall or assure that employees are able to rescue themselves.
- Personal fall arrest systems shall be inspected before each use for wear, damage, and other deterioration, and defective components shall be removed from service.
- Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists unless prior approval is obtained from a competent person.

- If and when a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

5.1.2 Stopping a Fall

- The arresting force on an employee stopped by a fall shall be limited to a maximum arresting force of 1,800 pounds when wearing a body harness.
- The fall arrest system shall be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level.
- The fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.
- The fall arrest system shall have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

5.1.3 Protection from Falling Objects

- Robinson Brothers Construction, Inc. has a barricading policy to prevent objects from falling, to keep employees from entering and to keep objects that may fall, away from the edge of a higher level.
- Waste, materials, or tools shall not be thrown from buildings or structures to areas where employee(s) may be located, unless the area where the material falls is guarded by fences, barricades or other methods/means to prevent employee(s) from entering and being struck by falling objects. Signs shall be posted to warn employees of the hazard.
- Employees performing work at elevated levels shall keep tools, materials, and equipment away from the edge to keep potential objects from falling over the side. Where practical, tools, etc. shall be secured with rope, wire, etc. to keep them from falling.

5.1.4 Standard Guardrails

A standard guardrail shall consist of top rail, midrail or equivalent protection, and posts, and shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the floor, platform, runway, or ramp level.

5.2 Safety Nets

5.2.1 Requirements of Safety Nets

Where the elevation is 25 feet or more above the ground, water surface, or continuous floor level below, and when the use of personal fall arrest systems, personal fall restraint systems, positioning device systems or more conventional types of protection are clearly impractical. The exterior and/or interior perimeter of the structure shall be provided with an approved safety net extending at least 8 feet horizontally from such perimeter and being positioned at a distance not to exceed 10 feet vertically below where such hazards exist. Alternatively, equivalent protection provided safety nets shall extend outward from the outermost projection of the work surface as follows:

- Vertical Distance (VD) up to 5 feet requires 8 feet of Horizontal Distance (HD) -+5 feet up to feet of VD requires 10 feet of HD - More than 10 feet but not to exceed 30 feet of VD requires 13 feet of HD.
- Nets shall be hung with sufficient clearance to prevent user's contact with the surfaces or structures below. Such clearances shall be determined by impact load testing.

5.2.2 Portable Ladders

Tools required to perform a task shall be transported by a mechanical carrier such as a tagline, suspended bucket or tool belt.

- Tools shall not be carried by hand while climbing.
- Hands must be free to grip the ladder.
- Tools shall not be carried in clothing pockets.
- Tools shall be pulled up to the job site only after reaching the area of work.

When work is to be performed from straight/extension ladders, fall protection shall be utilized when heights exceed 6 feet.

Straight ladders shall be tied off at the top to prevent them from moving. A second person shall steady the ladder at the base while it is being tied off at the top by another employee. Do not tie off fall protection equipment to the ladder.

5.2.3 Storage

A dedicated storage area shall be provided for the storage of fall protection equipment and all components. The storage area shall keep the equipment clean, dry, and free from oils, chemicals, paints, and excessive heat.

5.3 Inspections

Fall protection equipment shall be inspected before each use for wear, damage, other deterioration, or other defects.

5.4 Elevated Personnel Platforms

Work performed, regardless of the nature of the work, from personnel platforms raised by forklifts, cranes, scissor lifts, etc., shall require the use of a full body harness and shall be connected to the platform.

5.5 Incident Investigations

- Robinson Brothers Construction, Inc. shall conduct accident investigations in the event of a fall, near miss or other types of serious incident.
- Accident investigations shall be conducted to evaluate the fall protection plan for potential
- Updates to practices, procedures or training to prevent reoccurrence.

Changes to the fall protection program shall be implemented if deemed appropriate from incident corrective actions.

6.0 RECORDKEEPING

6.1 Program Audits and Record Keeping

The following requirements apply to maintenance of Fall Protection Program records:

- Equipment inspection and training records shall be maintained for a minimum of three years.
- Training records shall include sign in sheets with each employee's name and date of the training.

7.0 REFERENCES

1.	**Documents & External References** http://bfa.sdsu.edu/ehs/pdf/FallProtect.pdf, Subchapter 4. Construction Safety Orders Article 24. Fall Protection,

8.0 REVISION INFORMATION

This section applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
CAL OSHA HAZCOM		
Version: 1.1	**Date Approved:** 18 January 2017	Health, and Safety Environmental **CSO:** Joe Bergren

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AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The purpose of this program is to ensure the safety of all employees and contractors working for Robinson Brothers Construction, Inc. along with complying with all regulations pertaining to the key changes in the Hazard Communication Standard, which affects both chemical suppliers (manufacturers, importers, distributors) and employers whose employees may be exposed to hazardous chemicals

1.1 Scope

This program covers all Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent. While working, and performing tasks on a non-owned or operated site, the operator's program shall take precedence.

2.0 DEFINITIONS

Term	Description
Classification	To identify the relevant data regarding the hazards of a chemical; review those data to ascertain hazards associated with the chemical, and decide whether the chemical will be classified as hazardous, and the degree of hazard where appropriate, by comparing the data with the criteria for health and physical hazards. Typical classifications might be flammable, corrosive, reactive and toxic.
Hazardous Chemical	Any chemical that is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, a hazard not otherwise classified, or is included in the Director's List of Hazardous Substances.
Label	An appropriate group of written, printed, graphic information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the immediate container of a hazardous chemical, or to the outside packaging.
Physical Hazard	A chemical that is classified as posing one of the following hazardous effects: • Explosive; flammable (gases, aerosols, liquids, or solids); • Oxidizer (liquid, solid or gas); • Self-Reactive; pyrophoric (liquid or solid); self-heating; • Organic peroxide; corrosive to metal;

	• gas under pressure; combustible liquid; water reactive; or • In contact with water emits flammable gas. Physical Criteria can be found in 29 CFR §1910.1200 Appendix B (8 CCR §5194- Appendix B references this federal regulation).
Pictogram	A composition that may include a symbol plus other graphic elements, such as a border, background pattern or color that is intended to convey specific information about the hazards of a chemical.
Precautionary Statement	A phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to hazardous chemicals, or improper storage or handling. Statements are listed as "P" codes on GHS-compliant labels and SDSs.
Pyrophoric Gas	A chemical that will ignite spontaneously in the air, at a temperature of 130 degrees F (54.4 degrees C) or below.
Safety Data Sheet (SDS)	Written or printed material concerning a hazardous chemical that is prepared in accordance with 8 CCR §5194(g). (See Appendix B for details).
Signal Word	A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for the less severe.
Simple Asphyxiant	A substance or mixture that displaces oxygen in the ambient atmosphere, and can thus cause oxygen deprivation in those individuals who are exposed, leading to unconsciousness and death.
Trade Secret	Any confidential formula, pattern, process, device, information, or compilation of information which gives its user an opportunity to obtain a business advantage over competitors who do not know or use it. A trade secret shall not include chemical identify information which is readily discoverable through qualitative analysis.
Use	To package, handle, react, or transfer.
Workplace Label	"Non-original manufacturer label"- Label placed on a secondary (workplace) container. When hazardous material is removed/transferred from the original manufacturer labeled container to another container (secondary (workplace) container), the secondary (workplace) container must have a workplace label with the exception of portable containers that will contain chemicals for immediate use.

2.1 Role and Responsibilities

2.1.1 Employer:

- Robinson Brothers Construction, Inc. has a written hazard communication program. Robinson Brothers Construction, Inc. shall develop, implement and maintain at the workplace a written hazard communication program for their employees.

- Robinson Brothers Construction, Inc. will ensure the written hazard communication program be made available to employees and their designated representatives.
- Robinson Brothers Construction, Inc. shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Chief, and NIOSH.
- Robinson Brothers Construction, Inc. is responsible for replacing old SDSs with updated sheets when they are received.
- The manufacturer, importer or employer preparing the Safety Data Sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination.
- If the manufacturer, importer, or employer becomes aware of any significant information regarding the hazards of a substance, or ways to protect against the hazards, this new information shall be added to the Safety Data Sheet within three months.
- If the substance is not currently being produced or imported, the manufacturer or importer shall add the information to the Safety Data Sheet before the substance is introduced into the workplace again

2.1.2 Safety Manager:

- The Safety Manager is responsible for developing and implementing the hazard communication program. Managers are responsible for maintaining Safety Data Sheets and the chemical inventory list for their locations.
- The local Manager reviews the SDS files and chemical inventory list at each location at least annually to ensure that they are complete and up to date.
- SDSs will not be maintained for chemicals not present on site.
- Employees are responsible for following the requirements in the hazard communication program, to use proper personal protective equipment, to report containers without labels immediately and to not deface any label.
- Any employee who transfers any material from one container to another is responsible for labeling the new container with all required information.

2.1.3 Employees:

- All employees are responsible for learning the requirements of this section and for applying them to their daily work routine.

3.0 SAFETY

OSHA has modified the Hazard Communication Standard (HCS) to adopt the GHS to improve safety and health of workers through more effective communications on chemical hazards.

Adoption of the GHS in the US and around the world will also help to improve information received from other countries—since the US is both a major importer and exporter of chemicals, American workers often see labels and safety data sheets from other countries.

The diverse and sometimes conflicting national and international requirements can create confusion among those who seek to use hazard information effectively. If countries around the world adopt the GHS, these problems will be minimized, and chemicals crossing borders will have consistent information, thus improving communication globally.

4.0 TRAINING

Training shall be provided to employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard is introduced into their work area. Information and training may relate to general classes of hazardous chemicals to the extent appropriate and related to reasonably foreseeable exposures of the job.

Chemical-specific information must always be available through labels and safety data sheets (SDS). Information and training shall consist of at least the following topics:

- Employees shall be informed of the requirements of this section.
- Employees shall be informed of any operations in their work area where hazardous chemicals are present.
- Employees shall be informed of the location and availability of the written hazard communication program, including the list(s) of hazardous chemicals and safety data sheets required by this section.
- Employees shall be trained in the methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.).

4.1.1 Training Content

Employees shall be trained in the physical, health, simple asphyxiation, combustible dust and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area, and the measures they can take to protect themselves from these hazards, including:

a. Specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, which include:

- Appropriate work practices
- Emergency procedures and
- Personal protective equipment to be used

b. Employees shall be trained in the details of the hazard communication program developed by the employer, including:

- An explanation of the labels received on shipped containers and the workplace

labeling system used by their employer and the safety data sheet, and

- How employees can obtain and use the appropriate hazard information.

c. Employers shall inform employees of their right:

- To personally receive information regarding hazardous chemicals to which they may be exposed.
- For their physician or collective bargaining agent to receive information regarding hazardous chemicals to which the employee may be exposed.
- Against discharge or other discrimination due to the employee's exercising their rights afforded to them under the pursuant provisions of the *Hazardous Substances Information and Training Act.*
- Whenever the employer receives a new or revised safety data sheet, the new information shall be provided to the employees. If the new information on a safety data sheet indicates significantly increased risks to, or measures necessary to protect, employee health as compared to those stated on a safety data sheet previously provided. The information shall be provided to the employees not to exceed 30 days after receipt.

5.0 PROCEDURE

Detailed instructions for evaluation, classification, categorization of the hazards and use of label elements are provided in the mandatory Appendices A, B, C, and D of the standard (T8CCR 5194).

5.1 Proposition 65 Warnings

A. Appendices:

Notwithstanding any other provision of law including the preceding subsections. An employer which is a person doing business within the meaning of the Health and Safety Code Section 25249.11(a) and (b), is subject to the Safe Drinking Water and Toxic Enforcement Act of 1986. (Proposition 65 or the "Act") (Health and Safety Code § 25249.5 et seq.) moreover, shall comply with the Act in the manner outlined in appendices (B) and (C).

The following employers are not subject to the Act:

- An employer employing fewer than ten employees
- Any city, county, or district or any department or agency thereof or the state or any department or agency thereof or the federal government or any department or agency thereof,
- Any entity in its operation of a public water system as defined in Health and Safety Code Section 4010.1.

B. Appendices

Exposures Subject to Proposition 65 and Hazard Communication. Before exposing any employee to any hazardous substance that otherwise falls within the scope of this section and which

requires a warning under this Act (see 22 CCR Section 12000, Chemicals Known to the State to Cause Cancer or Reproductive Toxicity) except as provided in appendices (D).

C. Appendices

Exposures Subject to Proposition 65 Only. Before knowingly and intentionally exposing any employee to any hazardous substance that does not otherwise fall within the scope of the section, but which requires a warning under the Act (see 22 CCR Section 12000, Chemicals Known to the State to Cause Cancer or Reproductive Toxicity). Except as provided in appendices (D) below, any employer subject to the Act shall either provide a warning to employees in compliance with California Code of Regulations.

D. Appendices

Exposures Not Subject to Proposition 65. A warning required by appendices (B) and (C) above shall not apply to any of the following:

- An exposure for which federal law governs warning in a manner that preempts state authority.
- An exposure that takes place less than twelve months after the listing of the chemical in 22 CCR Section 12000.

Exposure for which the employer responsible can show that the exposure poses no significant risk. Assuming lifetime exposure at the level in question for the chemicals known to the State to cause cancer, and that the exposure will have no observable effect assuming exposure at one thousand (1,000) times the level in question for chemicals known to the State to cause reproductive toxicity. Based on evidence and standards of comparable scientific validity to the evidence and standards which form the scientific basis for the listing of such chemical in 22 CCR Section 12000. In any enforcement action, the burden of showing that an exposure meets the criteria of this subsection shall be on the employer.

5.2 Required Product Label Elements

Suppliers must develop new product labels that include signal words, pictograms, hazard statements, and precautionary statements for chemicals based on their hazard classification and category. Employers must ensure that employees understand the meaning of each of these elements on the new labels. See Appendix 1 *Sample of Label* in the Appendices section 9.0.

5.3 Safety Data Sheets Format

Safety data sheets (SDS) have replaced material safety data sheets (MSDS). Suppliers now must prepare safety data sheets for their products that follow a standardized 16-section format in conveying information about a hazardous chemical's health effects and physical and chemical characteristics. The new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Hazardous Chemical's Health Effects and Physical and Chemical Characteristics	
Section 1	Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2	Hazard(s) identification includes all hazards regarding the chemical; required label elements.
Section 3	Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
Section 4	First-aid measures include important symptoms/effects, acute, delayed; "required treatment."
Section 5	Fire-fighting measures list suitable extinguishing techniques, equipment; "chemical hazards" from fire.
Section 6	Accidental release measures list emergency procedures; protective equipment; proper methods of containment and clean-up.
Section 7	Handling /storage lists precautions for safe handling and storage, including incompatibilities.
Section 8	Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).
Section 9	Physical and chemical properties list the chemical's characteristics.
Section 10	Stability and reactivity list chemical stability and possibility of hazardous reactions.
Section 11	Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
Section 12	Ecological information*
Section 13	Disposal considerations*
Section 14	Transport information*
Section 15	Regulatory information*
Section 16	Other information, includes the date of preparation or last revision.

5.4 Material (Hazmat) SDS

A dangerous good is any solid, liquid, or gas that can harm people, other living organisms, property, or the environment. An equivalent term used almost exclusively in the United States is hazardous material (HAZMAT). Dangerous goods may be radioactive, flammable, explosive, toxic, corrosive, biohazardous, an oxidizer, an asphyxiant, a pathogen, an allergen, or may have other characteristics that render it hazardous in specific circumstances. See *Appendix 2* for *Hazardous Material (Hazmat) SDS* information, and images.

5.5 Written Hazard Communication Program

As before, it remains the employer's responsibility to develop and implement a written hazard communication (HAZCOM) program, which includes a list of hazardous chemicals known to be present, container labels, safety data sheets, and employee information and training. Safety data sheets must be immediately available to employees.

5.6 Hazard Communication Standard Pictogram

The Hazard Communication Standard (HCS) will require pictograms on labels to alert users of the chemical hazards to which they may be exposed. Each pictogram consists of a symbol on a white background framed by a red border and represents a distinct hazard(s). The pictogram on the label is determined by the chemical hazard classification.

a. General Comments:

- The GHS pictograms are provided to assist in evaluating the GHS label elements.
- The transport pictograms are included to show the variation in background and color.

See *Appendix 3* for *Pictograms Hazard Classes* and *Appendix 4 for Physical Hazards* information.

Hazardous Non-Routine Tasks

Periodically, our employees are required to perform hazardous non-routine tasks. Prior to starting work on such projects, affected employees will be given information by their supervisor on hazards to which they may be exposed during such an activity. This information will cover:

- Specific hazards
- Measures taken to reduce the risk of these hazards, such as providing ventilation, ensuring the presence of another employee, providing a respiratory protection program, and establishing emergency procedures
- Required protective/safety measures Non-routine tasks performed/hazardous chemicals used by employees of this company are given below. You need to create your own list to fit your tasks.

Note: The first sample item is already completed. In the second sample item, you are to insert the hazardous substance used for the task. In the third item, you are to insert the non-routine task and hazardous substance used for the task.

Non-Routine Task	Hazardous Substance
Clearing a stopped drain	Sodium Hydroxide
Stripping particularly heavy deposits of grease	

6.0 RECORDKEEPING

Documentation of safety and health training required by CCR 5194 subsection (a)(7) for each employee, including:

- employee name or other types of identifiers,
- training dates,
- type(s) of training, and
- training providers.

This documentation shall be maintained for at least one (1) year.

7.0 REFERENCES

1.	**Documents & External References** http://www.dir.ca.gov/dosh/dosh_publications/ghs_fs.pdf., Hazard Communication and the Globally Harmonized System (GHS), https://www.osha.gov/dsg/hazcom/ghoshacomparison.html, http://info.era-environmental.com/blog/ghs-hazard-classification-pt-1-everything-you-need-to-know, ERA's Environmental Compliance Management, https://www.osha.gov/dsg/hazcom/ghoshacomparison.html,

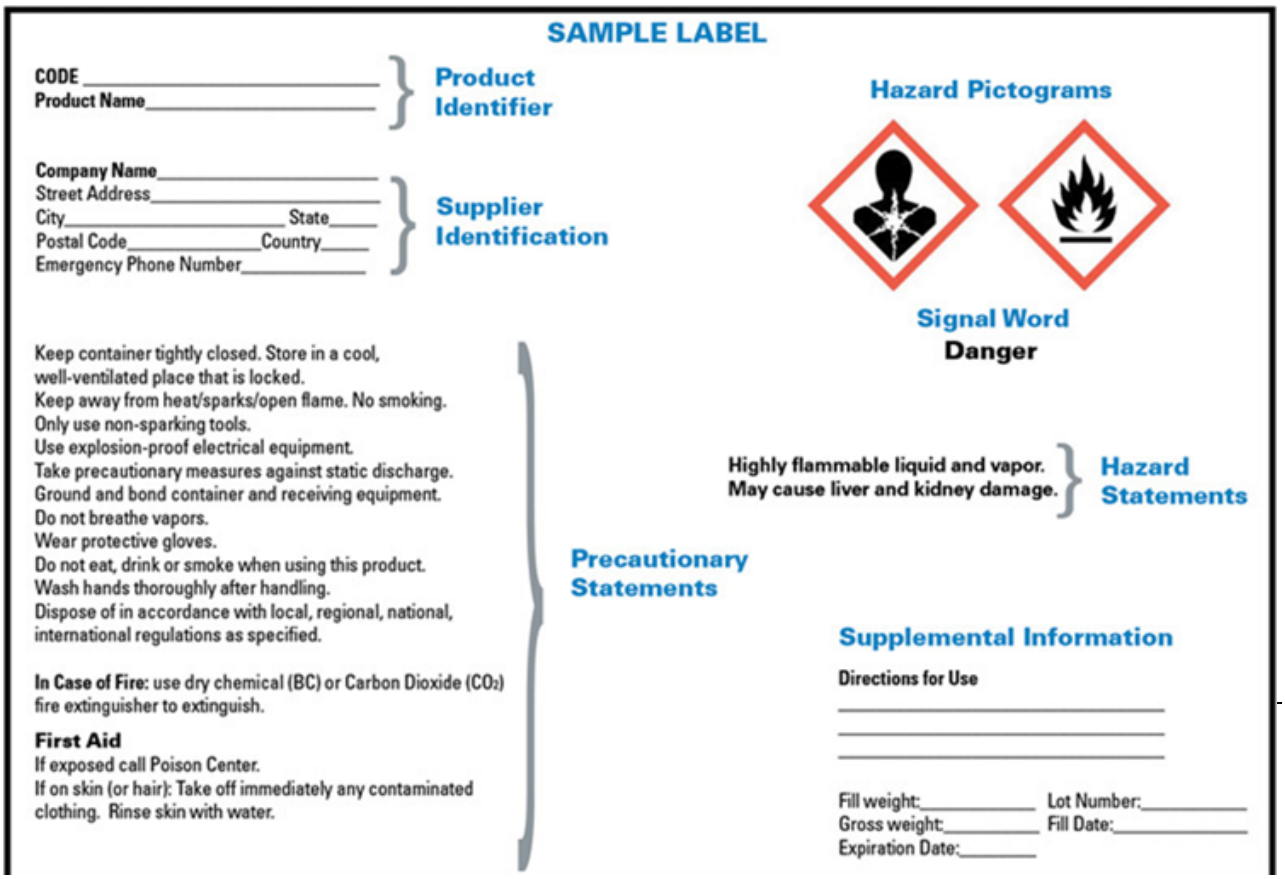
8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

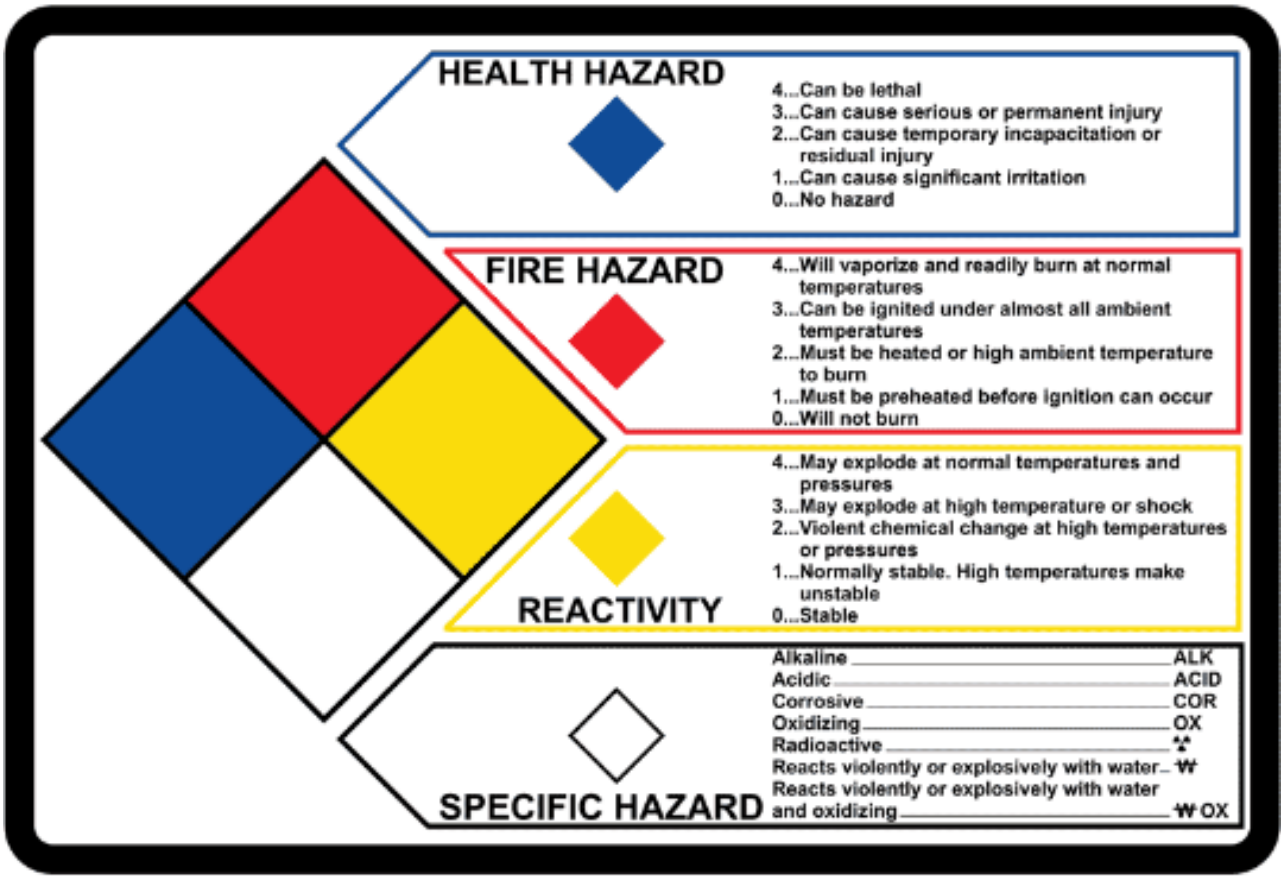
Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Sample of Label



Appendix 2: Hazardous Material (Hazmat) SDS



Appendix 3: GHS Pictograms & Hazard Classes

GHS Pictograms & Hazard Classes		
		
• Explosives • Self-reactives • Organic peroxides	• Flammables • Self-reactives • Pyrophorics • Self-heating • Emits flammable gas	• Oxidizers • Organic peroxides
		
• Gases under pressure	• Acute toxicity	• Acute toxicity • Skin irritation • Eye irritation • Skin sensitizers
		
• Carcinogens • Respiratory sensitizers • Reproductive toxicity • Target organ toxicity • Germ cell mutagens	• Eye corrosion • Skin corrosion • Corrosive to metal	• Aquatic toxicity

Appendix 4: Physical Hazards

Hazard Class	Associated Hazard Category
Explosives	Divisions 1.1-1.6 (with 1.1 being the most hazardous, 1.6 the least hazardous)
Flammable gases	Categories 1 and 2
Flammable aerosols	Categories 1 and 2
Oxidizing gases	Category 1
Gases under pressure	4 Groups include: Compressed gas, Liquefied gas, Dissolved gas, and Refrigerated liquefied gas
Flammable liquids	Categories 1 - 4
Flammable solids	Categories 1 and 2
Self-reactive substances	Types A-G
Pyrophoric solids	Category 1
Pyrophoric liquids	Category 1
Self-heating substances	Categories 1 and 2
Substances which in contact with water emit flammable gases	Categories 1 - 3
Oxidizing liquids	Categories 1 - 3
Oxidizing solids	Categories 1 - 3
Organic peroxides	Types A-G
Substances corrosive to metal	Category 1

Hazard Class	Associated Hazard Category
Acute toxicity	Categories 1-4 (with 1 being the most dangerous)
Skin corrosion	Categories 1A, 1B, 1C, and 2
Skin irritation	Categories 1A, 1B, 1C, and 2
Eye Effects	Categories 1, 2A, and 2B
Sensitization (Skin or Eye)	Category 1A and 1B
Germ cell mutagenicity	Categories 1A, 1B, and 2
Carcinogenicity	Categories 1A, 1B, and 2
Reproductive toxicity	Categories 1A, 1B, 2, and additional category for effects on or via lactation
Target organ systemic toxicity: single and repeated exposure	Single: Categories 1-3
Hazard Class	**Associated Hazard Category**
Acute Aquatic Toxicity	Categories 1 -3
Chronic Aquatic Toxicity	Categories 1 - 4

Robinson Brothers Construction, Inc.		
CAL OSHA HEAT ILLNESS PREVENTION		
Version: 1.0	**Date Approved:** 31 October 2016	Health, and Safety Environmental **CSO:** Joe Bergren

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

Work performed outdoors in California must comply with the Heat Illness Prevention Standard T8 CCR 3395. This program is designed to reduce the risk of work--related heat illnesses.

1.1 Scope

This document applies to all of Robinson Brothers Construction, Inc.'s work performed in California but should be followed for any location.
Joe Bergren is who is assigned and has the responsibility, authority, and overall accountability for this procedure.

2.0 DEFINITIONS

Term	Description
Acclimatization	Temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.
Heat Illness	A serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.
Shade	Blockage of direct sunlight. Canopies, umbrellas, and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when the heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

2.1 Roles and Responsibilities

2.1.1 Management

Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees.

2.1.2 Managers and supervisors

Managers and supervisors are expected to enforce the rules fairly and uniformly.

2.1.3 Employees

All employees will comply with safe and healthy work practices by incentives, training, re-training programs and disciplinary programs.

Our system of ensuring that all employees comply with the rules and maintain a safe work environment include:

- Informing employees of the provisions of our IIP Program
- Evaluating the safety performance of all employees
- Recognizing employees who perform safe and healthful work practices
- Providing training to employees whose safety performance is deficient
- Disciplining employees for failure to comply with safe and healthful work practices

3.0 SAFETY

3.1 Safety Inspections

Safety Inspections are done periodic and documented. Documentation should include:

- Name of the inspector
- Date of inspection &
- Findings.

4.0 TRAINING

Employees will receive training in the Robinson Brothers Construction, Inc. heat illness prevention procedures. Training in the following topics shall be provided to all supervisory and non-supervisory employees:

- The environmental and personal risk factors for heat illness
- Robinson Brothers Construction, Inc. procedures for complying with the requirements of the Heat Illness Prevention Standard T8 CCR 3395,
- The importance of frequent consumption of small quantities of water, up to 4 cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties,
- The importance of acclimatization,
- The different types of heat illness and the common signs and symptoms of heat illness,
- The importance to employees of immediately reporting to the employer, directly or through the employee's supervisor, symptoms or signs of heat illness in themselves, or in cos workers,
- Robinson Brothers Construction, Inc. procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become

necessary,

- Robinson Brothers Construction, Inc. procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider,
- Robinson Brothers Construction, Inc. procedures for ensuring that, in the event of an emergency, clear and
- precise directions to the work site can and will be provided as needed to emergency responders, and
- Supervisors will be trained in heat-related illness before supervision of employees working in the heat.

Additionally, the supervisors will be trained in Robinson Brothers Construction, Inc.'s procedures. The supervisor is to follow, and implement the applicable procedures to prevent heat illness as well as the procedures that he or she will follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.

Communication for employees shall be in a form readily understandable by all affected employees. Robinson Brothers Construction, Inc. will ensure all contractors, subcontractors, staffing companies, etc. employees (including temporary) working outdoors have been trained in heat illness prevention. Every Robinson Brothers Construction, Inc. employee will comply with safe and healthy work practices by incentives, training, re-training programs and disciplinary programs.

5.0 PROCEDURE

5.1 Requirements

All managers and supervisors are responsible for implementing and maintaining the Heat Illness Program in their work areas. High-heat procedures are to be followed when the temperature exceeds 95 degrees Fahrenheit. High-heat procedures shall include, but are not limited to:

- Effective communication by voice, observation or electronic means,
- Observation of employees for alertness and signs/symptoms of heat illness,
- Reminding employees to drink water throughout the shift,
- Closely supervising employees for their first 14 days of employment, and
- The provisions of this procedure

5.2 Provision of Water

Employees shall have access to potable drinking water. Where it is not plumbed or otherwise continuously applied, it shall be provided in sufficient quantity at the beginning of the work shift.

5.3 Access to Shade

Employees will be provided with access to shade. Robinson Brothers Construction, Inc. CSO, Joe Bergren must ensure shade is up and available at the beginning of a shift when the temperature is forecasted to be 80 degrees Fahrenheit or greater. At or below 80 degrees Fahrenheit the employee shall have timely

access to shade upon request. For temperatures at or above 80 degrees Fahrenheit, one or more areas with shade shall be provided at all times while employees are present. Shade shall accommodate the number of employees on recovery or rest periods.

Employees suffering from heat illness or believing a preventative recovery period is needed shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access to shade shall be permitted at all times. See definition of "Shade."

5.4 Written Procedures

The heat prevention program/procedures shall be made available to employees. The procedures for Robinson Brothers Construction, Inc. shall be in writing and shall be made available to employees.

Each work site shall develop site specific procedures but shall include the minimum:

- Bring at least 2 quarts per employee at the start of the shift and the supervisors/designated persons will monitor water containers every 30 minutes, and employees are encouraged to report to supervisor/designated person low levels or dirty water.
- Supervisors will provide frequent reminders to employees to drink frequently.
- Every morning there will be short tailgate meetings to remind workers about the importance of frequent consumption of water throughout the shift during hot weather.
- Place water containers as close as possible to the workers.
- When drinking water levels within a container drop below 50%, the water shall be replenished immediately, or water levels should not fall below the point that will allow for adequate water during the time necessary to effect replenishment.
- Disposable/single-use drinking cups will be provided to employees or provisions will be made to issue employees their own cups each day.
- Supervisors will set up an adequate number of umbrellas, canopies or other portable devices at the start of the shift and will relocate them to be closer to the crew, as needed.
- Non-agricultural employers can use other cooling measures if they demonstrate that these methods are as effective as shade.
- Working hours will be modified to work during the cooler hours of the day, when possible.
- When a modified or shorter works shift is not possible, more water and rest breaks will be provided.
- Supervisors will continuously check all employees and stay alert to the presence of heat-related symptoms.
- Supervisors will carry cell phones or other means of communication, to ensure that emergency services can be called and check that these are functional at the worksite before each shift.
- Every morning, workers will be reminded about the address and directions to the worksite, to inform medical responders and emergency procedures.
- All newly hired workers will be assigned a buddy or experienced coworker to ensure that they understood the training and follow Robinson Brothers Construction, Inc.'s procedures.

- **The Adequate System** is in place to communicate to affected employees on safety and health matters. Safety meetings, written communications, postings, etc. may be used.
- **The Reporting System** is in place for employees to report safety and health hazards/problems without fear of reprimand or reprisal.
- **The Safety System** is in place for identifying and evaluating workplace hazards. Both physical and chemical hazards should be included in the assessment process.

6.0 RECORDKEEPING

We have taken the following steps to implement and maintain our IIP Program:

- Records of hazard assessment inspections, including the person(s) conducting the inspection, the unsafe conditions and work practices that have been identified and the action taken to correct the identified unsafe conditions and work practices, are recorded on a hazard assessment and correction form.
- Documentation of safety and health training for each employee, including the employee's name or other identifier, training dates, type(s) of training, and training providers are recorded on an employee training and instruction form.
- We also include the records relating to employee training provided by a construction industry occupational safety and health training program approved by Cal/OSHA.

Inspection records and training documentation will be maintained according to the following checked schedule:

- For one year, except for training records of employees who have worked for less than one year which are provided to the employee upon termination of employment.

7.0 REFERENCES

1.	**Documents & External References**

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
CAL OSHA IIPP		
Version: 1.0	**Date Approved:** 28 November 2016	Health, and Safety Environmental **CSO:** Joe Bergren

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The Injury and Illness Prevention Program (IIP Program) administrator, who is Robinson Brothers Construction, Inc.'s Safety Manager, has the authority, responsibility and overall accountability for implementing the provisions of this program for Robinson Brothers Construction, Inc..

1.1 Scope

This program covers all the Robinson Brothers Construction, Inc. employees and other workers. Every manager and supervisors are responsible for implementing and maintaining the IIP Program in their work areas and for answering worker questions about the IIP Program. A copy of this IIP Program is available from each manager and supervisor.

2.0 DEFINITIONS

Term	Description

2.1 Roles and Responsibilities

2.1.1 Management

Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees.

2.1.2 Managers and supervisors

Managers and supervisors are expected to enforce the rules fairly and uniformly.

2.1.3 Employees

All employees will comply with safe and healthy work practices by incentives, training, re-training programs and disciplinary programs.

Our system of ensuring that all employees comply with the rules and maintain a safe work

environment include:

- Informing employees of the provisions of our IIP Program.
- Evaluating the safety performance of all employees
- Recognizing employees who perform safe and healthful work practices.
- Providing training to employees whose safety performance is deficient.
- Disciplining employees for failure to comply with safe and healthful work practices.

3.0 SAFETY

3.1.1 COMMUNICATION

We recognize that open, two-way communication between management and staff on health and safety issues is essential to an injury-free, productive workplace. The following system of communication is designed to facilitate a continuous flow of safety and health information between management and staff in a form that is readily understandable and consists of one or more of the following checked items:

- New employee orientation including a discussion of safety and health policies and procedures.
- Review of our IIP Program, workplace safety, and health training programs.
- Regularly scheduled safety meetings.
- Effective communication of safety and health concerns between employees and supervisors, including translation where appropriate.
- Posted or distributed safety information.
- A system for employees to report safety and health hazards/problems effectively and anonymously without fear of reprisal or reprimand.
- Where required, a labor/management safety and health committee that meets regularly, and prepares records of the safety and health committees meetings. The committee reviews the result of the periodic scheduled inspections, reviews investigations of accidents and exposures and make suggestions to management for the prevention of future incidents, reviews investigations of alleged hazardous conditions, and submits recommendations to assist in the evaluation of employee safety suggestions.

4.0 TRAINING

4.1.1 Training and Instruction

All employees, including managers and supervisors, shall have training and instruction on general and job--specific safety and health practices provided before or at the time of initial job assignment. Training and instruction shall be provided as follows:

- When the IIP Program is first established

- To all new employees, except for those in construction who are provided training through a Cal/OSHA approved construction industry occupational safety and health training program
- To all employees given new job assignments for which training has not been previously provided
- Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard
- Whenever the employer is made aware of a new or previously unrecognized hazard
- To supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed
- To all employees with respect to hazards specific to each employee's job assignment

Workplace safety and health training practices for all industries include, but are not limited to, the following:

- Explanation of the employer's IIP Program, emergency action plan, accident prevention plan, and measures for reporting any unsafe conditions, work practices, and injuries.
- Use of appropriate clothing including gloves, footwear, and personal protective equipment.
- Information about chemical hazards to which employees could be exposed and other hazard communication program information.
- Availability of toilet, hand-washing and drinking water facilities.
- Provisions for medical services and first aid including emergency procedures. Also, we provide specific instructions to all employees regarding hazards unique to their job assignment, to the extent that such information was not already covered in other training.

5.0 PROCEDURE

5.1 Hazard Assessment

Periodic inspections to identify and evaluate workplace hazards shall be performed by the following competent observer(s) in the following areas of our workplace:

Inspector	Inspection	Location	Frequency
Project Mgr. or Safety Representative	Safety Review	Project Site	Daily
Safety Group / Committee	Safety Evaluation	Project Site	As Needed

Periodic inspections are performed according to the following schedule:

- When new substances, processes, procedures, or, equipment which presents potential new

hazards are introduced into our workplace

- When new, previously unidentified hazards are recognized
- When occupational injuries and illnesses occur
- When we hire and/or reassign permanent or intermittent employees to processes, operations, or tasks for which a hazard evaluation has not been previously conducted.
- Whenever workplace conditions warrant an inspection
- Periodic inspections consist of identification and evaluation of workplace hazards utilizing applicable documentation and any other effective methods to identify and evaluate workplace hazards.

5.1.1 Accident and Exposure Investigations

Procedures for investigating workplace accidents and hazardous substance exposures include:

- Visiting the accident scene as soon as possible
- Interviewing injured workers and witnesses
- Examining the workplace for factors associated with the accident/exposure
- Determine the cause of the accident/exposure
- Taking corrective action to prevent the accident/exposure from recurring
- Recording the findings and corrective actions taken

5.2 Hazard Correction

Unsafe or unhealthy work circumstances, practices or procedures shall be corrected promptly based on the severity of the hazards.

Hazards shall be corrected according to the following procedures:

- When observed, or discovered.
- When an imminent hazard exists, which cannot be immediately abated without endangering employee (s) and/or property, we will remove all exposed workers from the area except those necessary to correct the existing condition.
- Workers necessary to correct the hazardous condition shall be provided with the necessary protection.
- All such actions taken and dates they are completed shall be documented on the appropriate forms.

6.0 RECORDKEEPING

Records of ***scheduled and periodic inspections*** including the person(s) conducting the inspection, the workplace hazards (i.e., unsafe conditions and work practices that have been identified) and the action(s) taken to correct the identified unsafe conditions and work practices, are recorded on the

- Hazard Assessment Checklist*

- The Identified Hazards and Correction Record*, and
- The Investigation / Corrective Action Report*.

These records are maintained for at least one (1) year.

EXCEPTION: – If an organization has fewer than ten employees and maintains inspection records only until the hazard is corrected.

Documentation of ***safety and health training*** for each worker, including the worker's name or other identifier, training dates, type(s) of training, and training providers are recorded on the Worker Training and Instruction Record*. This documentation is maintained for at least one (1) year.

EXCEPTION: – If an organization has fewer than ten employees and maintains a log of instructions provided to employees with respect to hazards unique to their job assignments when first hired or they are assigned new duties.

EXCEPTION: – If an organization retains training records for the term of employment of employees who work for us for less than one (1) year. These records are provided to the employee(s) upon termination of their employment.

7.0 REFERENCES

1.	**Documents & External References** https://www.dir.ca.gov/dosh/dosh_publications/iiphihzemp.pdf, https://www.dir.ca.gov/dosh/etools/09-031/sample.pdf,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
CAL OSHA RIGGING		
Version: 1.0	**Date Approved:** 31 October 2016	Health, and Safety Environmental **CSO:** Joe Bergren

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AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The purpose of this training program is to ensure a safe and incident free lifting operation for Robinson Brothers Construction, Inc., and is intended to serve as a standard-specific reference regarding the application of Rigging.

1.1 Scope

When work is performed in California on a non-owned or operated site, the operator's program shall take precedence. However, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Term	Description
Basket Hitch	A sling configuration whereby the sling is passed under the load and has both ends, end attachments, eyes or handles on the hook or a single master link.
Cable Laid Grommet	Hand Tucked. An endless wire rope sling made from one continuous length of rope formed to make a body composed of 6 ropes around a rope core. The rope ends are hand tucked into the body thus forming the core. No sleeves are used.
Choker Hitch	Choker Hitch. A sling configuration with one end of the sling passing under the load and through an end attachment, handle or eye on the other end of the sling.
Coatings	Elastomers or other suitable material applied to a sling to impart desirable properties.
Equivalent Entity	A person or organization (including an employer) which, by possession of equipment, technical knowledge, and skills, can perform with equal competence the same repairs and tests as the person or organization with which it is equated.
Fabric (Metal Mesh)	The flexible portion of the sling consisting of a series of transverse coils and cross rods and exclusive of terminal fittings.
Handle	A terminal fitting to which metal mesh fabric is attached. This terminal fitting may be either a male handle (triangle) or female handle (choker). (*See Figure S-2*) below.
Handle Eye	An opening in the handle shaped to accept a hook, shackle or other lifting device.

Handle, Female (Choker)	A terminal fitting containing a handle eye and a slot. The slot shall be of such a dimension as to permit passage of the male handle and thereby allow the use of the sling in a choker hitch.
Master Link, Coupling	Alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links. (*See Figure S-1*) below.
Proof Test	A non-destructive tension test made by the sling manufacturer or equivalent entity to verify construction and workmanship of the individual sling.
Rated Capacity (Working Load Limit)	The maximum allowable working load established by the sling manufacturer and permitted by the provisions of this Article.
Sling Manufacturer	A person or company assembling sling components into their final form for actual use. The sling manufacturer and the manufacturer of the sling material (Alloy steel chains, wire rope, metal mesh webbing, fiber rope or synthetic webbing) may or may not be identical.

2.1 Key Responsibilities

- Management shall determine if this program is required for regulatory compliance within his/her region.
- Management shall select a training facility or use an in-house qualified trainer to supply and document the training.
- The supervisor shall verify that each of their employees has the proper training before being involved in rigging operations.
- Only qualified and trained personnel can attach or detach lifting equipment to loads or lifting loads.
- Employees shall follow the requirements of this procedure.

3.0 SAFETY

3.1 Safe Operating Practices

Whenever any sling is used, the following practices shall be enforced:

- Slings that are damaged or defective shall not be used.
- Chain or wire rope slings shall not be shortened with knots or bolts or other makeshift devices.
- Slings shall not be kinked or knotted.
- Slings shall not be loaded in excess of their rated capacities as prescribed by the sling manufacturer on the identification markings permanently affixed to the sling.
- Slings used in a basket hitch shall have the loads balanced to prevent slippage.
- Slings shall be set to avoid slippage.
- Slings shall be padded or protected from the sharp edges of their loads.
- Suspended loads shall be kept clear of all obstructions.

- All employees shall be kept clear of loads about to be lifted and of suspended loads.
- Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
- Shock loading is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling and damage to the sling may result.
- Determine the maximum safe working loads of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products.
- Proof coil steel chain, also known as common or hardware chain, or other chain not recommended for slinging or hoisting by the manufacturer, shall not be used for hoisting purposes.
- Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six (6) months when recommended by the manufacturer.
- The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall not be annealed.
- Employers shall not use slings without affixed and legible identification markings.

4.0 TRAINING

Robinson Brothers Construction, Inc. employees shall display their competency in the following topics:

- The selection of proper hardware (eyebolts, shackles, hooks, wire rope products, synthetic slings, chain slings, etc.) for the correct application (weight, hitches, angles, temperatures, the center of gravity, etc.).
- The inspection of the selected hardware before, during and after the lift.
- The proper methods of securing the load, attaching the load to the hook, lifting the load, handling of the load during the movement of the load and lowering and placement of the load.
- The proper storage of the rigging equipment.

5.0 PROCEDURE

This procedure applies to slings used in conjunction with material handling equipment for the movement of material by hoisting. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene).

Note: All Illustrations and Examples of Tables in this document can be view at this link. https://www.dir.ca.gov/title8/5049.html.

EXCEPTION: Slings made from materials other than those detailed in this section shall be used only in accordance with the manufacturer's recommendations.

5.1 Inspection

Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a qualified person. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

5.2 Alloy Steel Chain Slings

5.2.1 Sling Identification.

Alloy steel chain slings shall have permanently affixed and legible markings as prescribed by the manufacturer that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs if more than one.

5.2.2 Attachments

Hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used, or the sling shall not be used in excess of the rated capacity of the weakest component.

Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used.

5.2.3 Inspections

In addition to the inspection required by Section 5043 of this Article, a thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of:

- Frequency of sling in use,
- Severity of service conditions,
- Nature of lifts being made, and
- Experience gained on the service life of slings used in similar circumstances.
- Such inspections shall in no event be at intervals greater than once every 12 months.
- Each employer shall make and maintain, for the service life of the sling, a record of the most recent month in which each alloy steel chain sling was thoroughly inspected, and shall make such record available for examination by the Division upon request.
- The thorough inspection of alloy steel chain slings shall be performed by a qualified person designated by the employer and shall include a thorough inspection for wear, defective welds, deformation and increase in link length.
- Where such defects or deterioration reduce the rated capacity, the sling shall be immediately removed from service.

5.2.4 Proof Testing:

The employer shall ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, shall be proof tested in accordance with the sling manufacturer's recommendations.

- The employer shall retain a certificate of the proof test, for the service life of the sling, and shall make it available for examination by the Division upon request.
- Minimum proof loads for alloy steel chain shall be equal to twice the working load limit values shown for single slings.

5.2.5 Sling Use

Alloy steel chain slings shall not be used with loads in excess of the rated capacities. Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.

5.2.6 Safe Operating Temperatures

Alloy steel chain slings shall be permanently removed from service if they are heated above 1000° F. When exposed to service temperatures in excess of 600° F, maximum working load limits permitted, they shall be reduced in accordance with the chain or sling manufacturer's recommendations.

5.2.7 Repairing and Reconditioning Alloy Steel Chain Slings

Worn or damaged alloy steel chain slings or attachments shall not be used until repaired. When alloy steel chain slings are repaired, or reconditioned, and welding or heat treating is involved, such slings shall be proof tested by the manufacturer or equivalent entity.

- Mechanical coupling links or low carbon steel repair links shall not be used to repair broken lengths of chain.

5.2.8 Effects of Wear

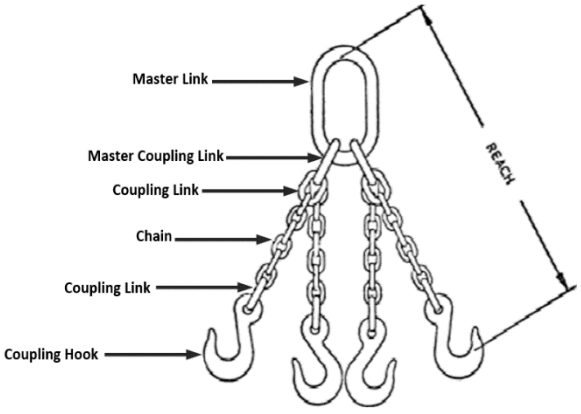
If the chain size at any point of any links is less than required, the sling shall be removed from service.

5.3 Deformed Attachments

- Alloy steel chain slings with cracked or deformed master links, coupling links or other components shall be removed from service. See *Figure S-1*.
- Slings shall be removed from service if hooks are cracked, have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

Figure S-1

Major Components of a Quadruple Sling



5.4 Wire Rope Slings

5.4.1 Sling Use

Wire rope slings shall not be used with loads in excess of the rated capacities. Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.

5.4.2 Minimum Sling Lengths

- Cable laid and 6 x 19 and 6 x 37 slings shall have a minimum clear length of wire rope ten (10) times the component rope diameter between splices, sleeves or end fittings.
- Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.
- Cable laid grommets; strand laid grommets, and endless slings shall have a minimum circumferential length of 96 times their body diameter.

5.4.3 Safe Operating Temperatures

Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200° F. When non-fiber core wire rope slings of any grade are used at temperatures above 400°F, or below minus 60°F, the sling manufacturer's recommendations shall be followed.

5.4.4 End Attachments

- Welding of end attachments, except covers to thimbles, shall be performed before the assembly of the sling.
- A prototype of each welded end attachment shall be proof tested by the manufacturer or equivalent entity to check the design and welding method at twice the rated capacity before production is started. Subsequent tests of random samples shall be made. The manufacturer or equivalent entity shall provide a certificate of such tests which the employer shall retain and make available for examination by the Division upon request.
- Where rope clip attachments are used, they shall be made with U-bolts on the dead or short end of the rope and the saddle on the live end.
- The minimum number of clips for end attachments shall be not less than indicated in manufacturer's tables, but in no case, shall be less than three for any permanent installation.
- Clips shall be drop-forged steel. The clips shall be spaced at a distance equal to at least six (6) times the diameter of the rope. All clip or clamp bolts shall be kept tight after tightening while the rope is under tension.

5.4.5 Removal from Service

Wire rope slings shall be immediately removed from service if any of the following conditions are present:

- Six (6) randomly distributed broken wires in one rope lay or three (3) broken wires in one strand in one rope lay.

- Wear or scraping of one-third the original diameter of outside individual wires.
- Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure.
- Evidence of heat damage.
- End attachments that are cracked deformed or worn to the point where the rated capacity is reduced.
- Hooks that have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.
- The corrosion that is of such severity or extent as to reduce the rated load capacity of the rope or end attachment.
- One or more broken wires within one rope lay of the end attachments. See Illustration 1

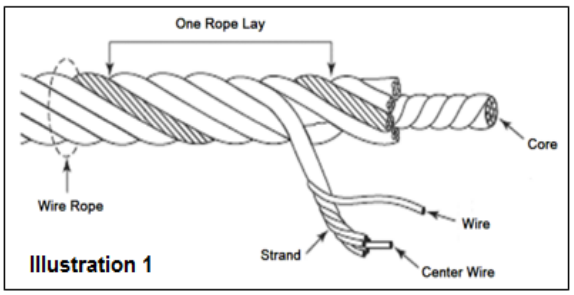


Illustration 1

5.4.6 Knots

Eyes in wire rope slings shall not be formed by using knots. Employers must ensure that wire rope and wire rope slings:

- Have permanently affixed and legible identification markings as prescribed by the manufacturer, and that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs if more than one; and
- Not be used without affixed and legible identification markings as required by subsection (g)(1) of this section.

5.5 Metal Mesh Slings

5.5.1 Sling Marking

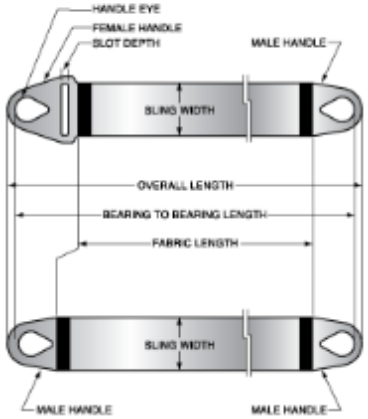
Each metal mesh sling shall have permanently affixed durable identification stating the following:

- Manufacturer's name or trademark.
- Rated capacity in vertical basket hitch and choker hitch.

5.5.2 Handles

Handles shall have a rated capacity at least equal to the metal fabric and exhibit no deformation after proof testing. See *Figure S-2.*

Figure S-2



Attachments of Handles to Fabric. The fabric and handles shall be joined so that:

- The rated capacity of the sling is not reduced.
- The load is evenly distributed across the width of the fabric.
- Sharp edges will not damage the fabric.

5.5.3 Sling Coatings

Coatings which diminish the rated capacity of a sling shall not be applied.

5.5.4 Sling Testing

All new and repaired metal mesh slings, including handles, shall not be used unless proof tested by the manufacturer or equivalent entity at a minimum of 1 1/2 times their rated capacity. Elastomer impregnated slings shall be proof tested before coating.

5.5.5 Proper Use of Metal Mesh Slings

Metal mesh slings shall not be used to lift loads more than their rated capacities. Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.

5.5.6 Safe Operating Temperatures

Metal mesh slings which are not impregnated with elastomers may be used in a temperature range from minus 20° F. to plus 550° F without decreasing the working load limit. Metal mesh slings impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200° F. For operations outside these temperature ranges or for metal mesh slings impregnated with other materials, the sling manufacturer's recommendations shall be followed.

5.5.7 Repairs

- Metal mesh slings which are repaired shall not be used unless repaired by a metal mesh sling manufacturer or an equivalent entity.
- Once repaired, each sling shall be permanently marked or tagged, or a written record maintained, to indicate the date and nature of the repairs and the person or organization that performed the repairs.

5.5.8 Removal from Service

Metal mesh slings shall be immediately removed from service if any of the following conditions are present:

- A broken weld or broken brazed joint along the sling edge.
- Reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
- Lack of flexibility due to distortion of the fabric.
- Distortion of the female handle so that the depth of the slot is increased more than 10 percent.

- Distortion of either handle so that the width of the eye is decreased more than 10 percent.
- A 15 percent reduction of the original cross-sectional area of metal at any point around the handle eye.
- Distortion of either handle out of its plane.

5.6 Natural and Synthetic Fiber Rope Slings

5.6.1 Sling Use

- Fiber rope slings made from conventional three strand construction fiber rope shall not be used with loads in excess of the rated capacities prescribed in *Tables S-18 through S-21* seen in *Appendix 1, 2, 3, and 4.*
- Fiber rope slings shall have a diameter of curvature meeting at least the minimums specified in *Figures S-4 and S-5* below.

Basic Sling Configurations with Vertical Legs S-4

NOTE: Legs 5° or less from vertical may be considered vertical. For slings with legs more than 5° off vertical, the actual angle as shown, in Figure S-5, must be considered.

Figure S-4

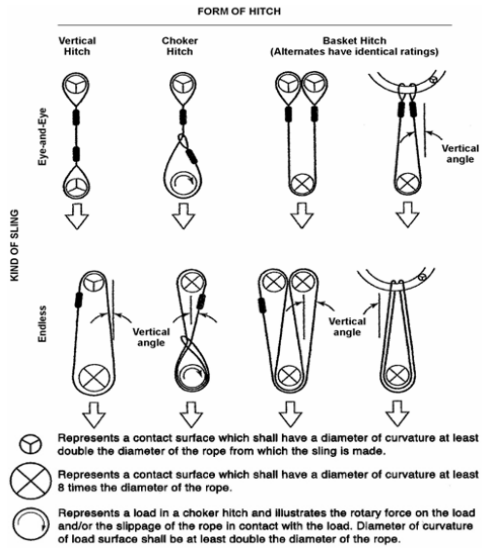
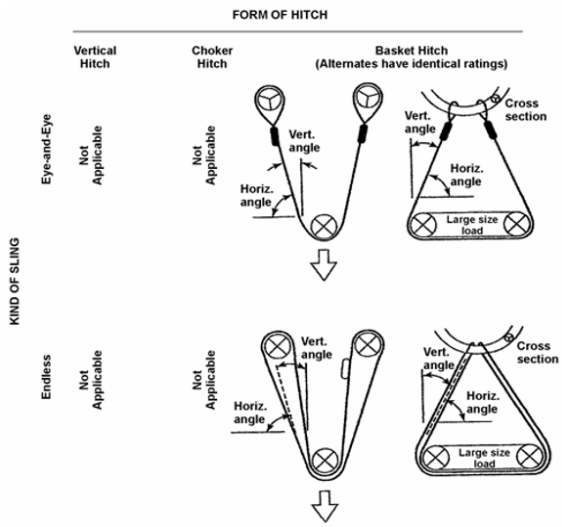


Figure S-5



- Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.
- Natural and synthetic fiber rope slings shall not be used for suspending personnel platforms.

5.6.2 Safe Operating Temperatures

Natural and synthetic fiber rope slings, except for wet, frozen slings, may be used in a temperature range from minus 20° F to plus 180° F without decreasing the working load limit. For operations outside this temperature range and for wet frozen slings, the sling manufacturer's recommendations shall be followed.

5.6.3 Splicing

Spliced fiber rope slings shall not be used unless they have been spliced in accordance with the following minimum requirements in accordance with any additional recommendations of the manufacturer:

- In manila rope, eye splices shall consist of at least three full tucks, and short splices shall consist of at least six full tucks, three on each side of the splice center line.
- In synthetic fiber rope, eye splices shall consist of at least four full tucks, and short splices shall consist of at least eight full tucks, four on each side of the center line.
- Strand end tails shall not be trimmed flush with the surface of the rope immediately adjacent to the full tucks. This information applies to all types of fiber rope and both eye and short splices. For fiber rope under one inch in diameter, the tail shall project at least six rope diameters beyond the last full tuck.
- For fiber rope one inch in diameter and larger, the tail shall project at least six inches beyond the last full tuck. Where a projecting tail interferes with the use of the sling, the tail shall be tapered and spliced into the body of the rope using at least two additional tucks (which will require a tail length of approximately six rope diameters beyond the last full tuck).
- Fiber rope slings shall have a minimum clear length of rope between eye splices equal to 10 times the rope diameter.
- Knots shall not be used in lieu of splices.
- Clamps not designed specifically for fiber ropes shall not be used for splicing.
- For all eye splices, the eye shall be of such size to provide an included angle of not greater than 60° degrees at the splice when the eye is placed over the load or support.

5.6.4 End Attachments

Fiber rope slings shall not be used if end attachments in contact with the rope have sharp edges or projections.

5.6.5 Removal from Service

Natural and synthetic fiber rope slings shall be immediately removed from service if any of the following conditions are present:

- Abnormal wear
- Powdered fiber between strands
- Broken or cut fibers
- Variations in the size or roundness of strands
- Discoloration or rotting
- Distortion of hardware in the sling.

5.6.6 Repairs

Repairs shall only be made by the manufacturer or equivalent entity. Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

Employers must ensure that natural and synthetic fiber rope slings:

- Have permanently affixed and legible identification markings as prescribed by the manufacturer, and that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, type of fiber material, and the number of legs if more than one; and
- Not be used without affixed and legible identification markings as required by subsection (g)(1) of this section.

5.7 Synthetic Web Slings

Sling Identification. Each sling shall be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

5.7.1 Synthetic Web Sling Storage

Synthetic web slings shall be stored in an area or facility where they are not subject to heat above 150^{o} F or exposed to direct sunlight.

Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendation.

5.8 Webbing

Synthetic webbing shall be of uniform thickness and width, and selvage edges shall not be split from the webbing's width.

5.8.1 Fittings

Fittings shall be:

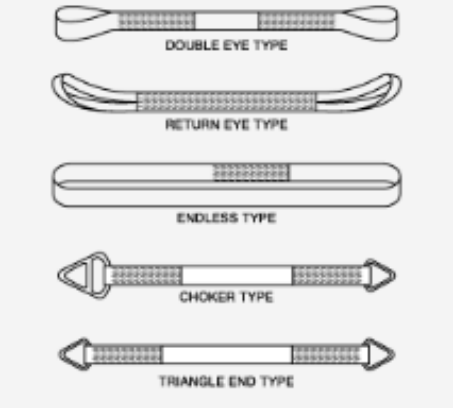
- Of a minimum breaking strength, equal to that of the sling; and
- Free of all sharp edges that could in any way damage the webbing.
- Attachment of End Fittings to Webbing and Formation of Eyes.
- Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.

5.8.2 Sling Use

Synthetic web see the slings illustrated in *Figure S-6* shall not be used with loads in excess of the rated capacities specified in *Tables S-22 through S-24* seen in *Appendix 5, 6, and 7*. Slings not included in these Orders shall be used only in accordance with the manufacturer's recommendations.

Figure S-6

Basic Synthetic Web Sling Construction



5.8.3 Environmental Conditions

When synthetic web slings are used, the following precautions shall be taken:

- Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.
- Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.
- Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

5.8.4 Safe Operating Temperatures

Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180° F. Polypropylene web slings shall not be used at temperatures in excess of 150° F.

5.8.5 Repairs

Synthetic web slings which are repaired shall not be used unless repaired by a sling manufacturer or an equivalent entity.

The employer shall retain a certificate of proof test, for the service life of the sling, and make it available for examination by the Division upon request.

Slings, including webbing and fittings, which have been repaired in a temporary manner shall not be used.

5.8.6 Removal from Service

Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

- Acid or caustic burns

- Melting or charring of any part of the sling surface
- Broken or worn stitches
- Distortion of fittings
- Snags, punctures, tears or cuts, or
- Those slings with other apparent defects shall be referred to the manufacturer or equivalent entity for determination of rated capacity and safety for continued use.

5.9 Defective Hoist or Sling Hooks and Rings

- Deformed or defective hooks or rings shall not be used.
- Deformed hooks or rings shall be replaced or repaired and reshaped under proper metallurgical control, and proof tested.
- Annealing or normalizing shall be done only in accordance with the chain manufacturer's specifications.
- Hooks and shackles shall be used in accordance with manufacturer's recommendations.
- All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain and keep readily available a certification record which includes the date of the test, the signature of the person who performed the test, and an identifier of the hook which was tested.
- Special custom design grabs, hooks, clamps, or other lifting accessories for such units as modular panels, prefabricated structures, and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested to 125 percent of the rated load before use.

5.9.1 Shackles

Employers must ensure that shackles:

- Have permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load
- Not be loaded in excess of its recommended safe working load as prescribed on the identification markings by the manufacturer, and
- Not be used without affixed and legible identification markings as required by subsection (g)(1) of this section.

6.0 RECORDKEEPING

Records of repairs shall be made available for examination by the Division upon request.

7.0 REFERENCES

1.	**Documents & External References** Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code, https://www.dir.ca.gov/.../Compliance-Directive.Cranes-and-Derricks-in- Construction.pdf,

	Compliance Directive for the Cranes and Derricks in Construction Standard, Article 15. Cranes and Derricks in Construction,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Table S-18 Manila Rope Sling

Table S-18 Manila Rope Slings

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Eye and eye sling: Vertical hitch	Eye and eye sling: Choker hitch	Eye and eye sling: Basket hitch; Angel of rope to horizontal: 90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	7.5	480	240	960	830	680	480
9/16	10.4	620	310	1,240	1,070	875	620
5/8	13.3	790	395	1,580	1,370	1,120	790
3/4	16.7	970	485	1,940	1,680	1,370	970
13/16	19.5	1,170	585	2,340	2,030	1,650	1,170
7/8	22.5	1,390	695	2,780	2,410	1,970	1,390
1	27.0	1,620	810	3,240	2,810	2,290	1,620
1 1/16	31.3	1,890	945	3,780	3,270	2,670	1,890
1 1/8	36.0	2,160	1,080	4,320	3,740	3,050	2,160
1 1/4	41.7	2,430	1,220	4,860	4,210	3,440	2,430
1 5/16	47.9	2,700	1,350	5,400	4,680	3,820	2,700
1 1/2	59.9	3,330	1,670	6,660	5,770	4,710	3,330
1 5/8	74.6	4,050	2,030	8,100	7,010	5,730	4,050
1 3/4	89.3	4,770	2,390	9,540	8,260	6,740	4,770
2	107.5	5,580	2,790	11,200	9,660	7,890	5,580
2 1/8	125.0	6,480	3,240	13,000	11,200	9,160	6,480
2 1/4	146.0	7,380	3,690	14,800	12,800	10,400	7,380
2 1/2	166.7	8,370	4,190	16,700	14,500	11,800	8,370
2 5/8	190.8	9,360	4,680	18,700	16,200	13,200	9,360

TABLE S-18. -- MANILA ROPE SLINGS
[Continued]

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Endless sling: Vertical hitch	Endless sling: Choker hitch	Endless sling: Basket hitch; Angel of rope to horizontal: 90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	7.5	865	430	1,730	1,500	1,220	865
9/16	10.4	1,120	560	2,230	1,930	1,580	1,120
5/8	13.3	1,420	710	2,840	2,460	2,010	1,420
3/4	16.7	1,750	875	3,490	3,020	2,470	1,750
13/16	19.5	2,110	1,050	4,210	3,650	2,980	2,110
7/8	22.5	2,500	1,250	5,000	4,330	3,540	2,500
1	27.0	2,920	1,460	5,830	5,050	4,120	2,920
1 1/16	31.3	3,400	1,700	6,800	5,890	4,810	3,400
1 1/8	36.0	3,890	1,940	7,780	6,730	5,500	3,890
1 1/4	41.7	4,370	2,190	8,750	7,580	6,190	4,370
1 5/16	47.9	4,860	2,430	9,720	8,420	6,870	4,860
1 1/2	59.9	5,990	3,000	12,000	10,400	8,480	5,990
1 5/8	74.6	7,290	3,650	14,600	12,600	10,300	7,290
1 3/4	89.3	8,590	4,290	17,200	14,900	12,100	8,590
2	107.5	10,000	5,020	20,100	17,400	14,200	10,000
2 1/8	125.0	11,700	5,830	23,300	20,200	16,500	11,700
2 1/4	146.0	13,300	6,640	26,600	23,000	18,800	13,300
2 1/2	166.7	15,100	7,530	30,100	26,100	21,300	15,100
2 5/8	190.8	16,800	8,420	33,700	29,200	23,800	16,800

Appendix 2: Table S-19 Nylon Rope Slings

Table S-19 Nylon Rope Slings

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Eye and eye sling						
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal				
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)	
1/2	6.5	635	320	1,270	1,100	900	635	
9/16	8.3	790	395	1,580	1,370	1,120	790	
5/8	10.5	1,030	515	2,060	1,780	1,460	1,030	
3/4	14.5	1,410	705	2,820	2,440	1,990	1,410	
13/16	17.0	1,680	840	3,360	2,910	2,380	1,680	
7/8	20.0	1,980	990	3,960	3,430	2,800	1,980	
1	26.0	2,480	1,240	4,960	4,300	3,510	2,480	
1 1/16	29.0	2,850	1,430	5,700	4,940	4,030	2,850	
1 1/8	34.0	3,270	1,640	6,540	5,660	4,620	3,270	
1 1/4	40.0	3,710	1,860	7,420	6,430	5,250	3,710	
1 5/16	45.0	4,260	2,130	8,520	7,380	6,020	4,260	
1 1/2	55.0	5,250	2,630	10,500	9,090	7,420	5,250	
1 5/8	68.0	6,440	3,220	12,900	11,200	9,110	6,440	
1 3/4	83.0	7,720	3,860	15,400	13,400	10,900	7,720	
2	95.0	9,110	4,560	18,200	15,800	12,900	9,110	
2 1/8	109.0	10,500	5,250	21,000	18,200	14,800	10,500	
2 1/4	129.0	12,400	6,200	24,800	21,500	17,500	12,400	
2 1/2	149.0	13,900	6,950	27,800	24,100	19,700	13,900	
2 5/8	168.0	16,000	8,000	32,000	27,700	22,600	16,000	

TABLE S-19. -- NYLON ROPE SLINGS
[Continued]

[Angle of rope to vertical shown in parentheses]

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Endless sling						
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal				
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)	
1/2	6.5	1,140	570	2,290	1,980	1,620	1,140	
9/16	8.3	1,420	710	2,840	2,460	2,010	1.420	
5/8	10.5	1,850	925	3,710	3,210	2,620	1,850	
3/4	14.5	2,540	1,270	5,080	4,400	3,590	2,540	
13/16	17.0	3,020	1,510	6,050	5,240	4,280	3,020	
7/8	20.0	3,560	1,780	7,130	6,170	5,040	3,560	
1	26.0	4,460	2,230	8,930	7,730	6,310	4,460	
1 1/16	29.0	5,130	2,570	10,300	8,890	7,260	5,130	
1 1/8	34.0	5,890	2,940	11,800	10,200	8,330	5,890	
1 1/4	40.0	6,680	3,340	13,400	11,600	9,450	6,680	
1 5/16	45.0	7,670	3,830	15,300	13,300	10,800	7,670	
1 1/2	55.0	9,450	4,730	18,900	16,400	13,400	9,450	
1 5/8	68.0	11,600	5,800	23,200	20,100	16,400	11,600	
1 3/4	83.0	13,900	6,950	27,800	24,100	19,700	13,900	
2	95.0	16,400	8,200	32,800	28,400	23,200	16,400	
2 1/8	109.0	18,900	9,450	37,800	32,700	26,700	18,900	
2 1/4	129.0	22,300	11,200	44,600	38,700	31,600	22,300	
2 1/2	149.0	25,000	12,500	50,000	43,300	35,400	25,000	
2 5/8	168.0	28,800	14,400	57,600	49,900	40,700	28,800	

Appendix 3: Table S-20 Polyester Rope Slings

Table S-20 Polyester Rope Slings

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Eye and eye sling					
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal			
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	8.0	635	320	1,270	1,100	900	635
9/16	10.2	790	395	1,580	1,370	1,120	790
5/8	13.0	990	495	1,980	1,710	1,400	990
3/4	17.5	1,240	620	2,480	2,150	1,750	1,240
13/16	21.0	1,540	770	3,080	2,670	2,180	1,540
7/8	25.0	1,780	890	3,560	3,080	2,520	1,780
1	30.5	2,180	1,090	4,360	3,780	3,080	2,180
1 1/16	34.5	2,530	1,270	5,060	4,380	3,580	2,530
1 1/8	40.0	2,920	1,460	5,840	5,060	4,130	2,920
1 1/4	46.3	3,290	1,650	6,580	5,700	4,650	3,290
1 5/16	52.5	3,710	1,860	7,420	6,430	5,250	3,710
1 1/2	66.8	4,630	2,320	9,260	8,020	6,550	4,630
1 5/8	82.0	5,640	2,820	11,300	9,770	7,980	5,640
1 3/4	98.0	6,710	3,360	13,400	11,600	9,490	6,710
2	118.0	7,920	3,960	15,800	13,700	11,200	7,920
2 1/8	135.0	9,110	4,460	18,200	15,800	12,900	9,110
2 1/4	157.0	10,600	5,300	21,200	18,400	15,000	10,600
2 1/2	181.0	12,100	6,050	24,200	21,000	17,100	12,100
2 5/8	205.0	13,600	6,800	27,200	23,600	19,200	13,600

TABLE S-20. -- POLYESTER ROPE SLINGS
[Continued]

[Angle of rope to vertical shown in parentheses]

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Endless sling					
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal			
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	8.0	1,140	570	2,290	1,980	1,620	1,140
9/16	10.2	1,420	710	2,840	2,460	2,010	1,420
5/8	13.0	1,780	890	3,570	3,090	2,520	1,780
3/4	17.5	2,230	1,120	4,470	3,870	3,160	2,230
13/16	21.0	2,770	1,390	5,540	4,800	3,920	2,770
7/8	25.0	3,200	1,600	6,410	5,550	4,530	3,200
1	30.5	3,920	2,960	7,850	6,800	5,550	3,920
1 1/16	34.5	4,550	2,280	9,110	7,990	6,440	4,550
1 1/8	40.0	5,260	2,630	10,500	9,100	7,440	5,260
1 1/4	46.3	5,920	2,960	11,800	10,300	8,380	5,920
1 5/16	52.5	6,680	3,340	13,400	11,600	9,450	6,680
1 1/2	66.8	8,330	4,170	16,700	14,400	11,800	8,330
1 5/8	82.0	10,200	5,080	20,300	17,600	14,400	10,200
1 3/4	98.0	12,100	6,040	24,200	20,900	17,100	12,100
2	118.0	14,300	7,130	28,500	24,700	20,200	14,300
2 1/8	135.0	16,400	8,200	32,800	28,400	23,200	16,400
2 1/4	157.0	19,100	9,540	38,200	33,100	27,000	19,100
2 1/2	181.0	21,800	10,900	43,600	37,700	30,800	21,800
2 5/8	205.0	24,500	12,200	49,000	42,400	34,600	24,500

Appendix 4: Table S-21 Polypropylene Rope Sling

Table S-21 Polypropylene Rope Slings

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Eye and eye sling					
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal			
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	4.7	645	325	1,290	1,120	910	645
9/16	6.1	780	390	1,560	1,350	1,100	780
5/8	7.5	950	475	1,900	1,650	1,340	950
3/4	10.7	1,300	650	2,600	2,250	1,840	1,300
13/16	12.7	1,520	760	3,040	2,630	2,150	1,520
7/8	15.0	1,760	880	3,520	3,050	2,490	1,760
1	18.0	2,140	1,070	4,280	3,700	3,030	2,140
1 1/16	20.4	2,450	1,230	4,900	4,240	3,460	2,450
1 1/8	23.7	2,800	1,400	5,600	4,850	3,960	2,800
1 1/4	27.0	3,210	1,610	6,420	5,560	4,540	3,210
1 5/16	30.5	3,600	1,800	7,200	6,240	5,090	3,600
1 1/2	38.5	4,540	2,270	9,080	7,860	6,420	4,540
1 5/8	47.5	5,510	2,760	11,000	9,540	7,790	5,510
1 3/4	57.0	6,580	3,290	13,200	11,400	9,300	6,580
2	69.0	7,960	3,980	15,900	13,800	11,300	7,960
2 1/8	80.0	9,330	4,670	18,700	16,200	13,200	9,330
2 1/4	92.0	10,600	5,300	21,200	18,400	15,000	10,600
2 1/2	107.0	12,200	6,100	24,400	21,100	17,300	12,200
2 5/8	120.0	13,800	6,900	27,600	23,900	19,600	13,800

TABLE S-21. -- POLYPROPYLENE ROPE SLINGS
[Continued]

[Angle of rope to vertical shown in parentheses]

Rope dia. nominal in inches	Nominal wt. per 100 ft in pounds	Endless sling					
		Vertical hitch	Choker hitch	Basket hitch; Angel of rope to horizontal			
				90 deg (0 deg)	60 deg (30 deg)	45 deg (45 deg)	30 deg (60 deg)
1/2	4.7	1,160	580	2,320	2,010	1,640	1,160
9/16	6.1	1,400	700	2,810	2,430	1,990	1,400
5/8	7.5	1,710	855	3,420	2,960	2,420	1,710
3/4	10.7	2,340	1,170	4,680	4,050	3,310	2,340
13/16	12.7	2,740	1,370	5,470	4,740	3,870	2,740
7/8	15.0	3,170	1,580	6,340	5,490	4,480	3,170
1	18.0	3,850	1,930	7,700	6,670	5,450	3,860
1 1/16	20.4	4,410	2,210	8,820	7,640	6,240	4,410
1 1/8	23.7	5,040	2,520	10,100	8,730	7,130	5,040
1 1/4	27.0	5,780	2,890	11,600	10,000	8,170	5,780
1 5/16	30.5	6,480	3,240	13,000	11,200	9,170	6,480
1 1/2	38.5	8,170	4,090	16,300	14,200	11,600	8,170
1 5/8	47.5	9,920	4,960	19,800	17,200	14,000	9,920
1 3/4	57.0	11,800	5,920	23,700	20,500	16,800	11,800
2	69.0	14,300	7,160	28,700	24,800	20,300	14,300
2 1/8	80.0	16,800	8,400	33,600	29,100	23,800	16,800
2 1/4	92.0	19,100	9,540	38,200	33,100	27,000	19,100
2 1/2	107.0	22,000	11,000	43,900	38,000	31,100	22,000
2 5/8	120.0	24,800	12,400	49,700	43,000	35,100	24,800

Appendix 5: Table S-22 Synthetic Web Slings

Table S-22

Rated Capacity in Pounds Synthetic Web Slings 1,000 Lbs. Per Inch of Width Single Ply

Sling body width, inches	Triangle -- Choker slings, type I: Triangle -- Triangle slings, type II: Eye and eye with flat eye slings, type III: Eye and eye with twisted eye slings, type IV					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,000	750	2,000	1,700	1,400	1,000
2	2,000	1,500	4,000	3,500	2,800	2,000
3	3,000	2,200	6,000	5,200	4,200	3,000
4	4,000	3,000	8,000	6,900	5,700	4,000
5	5,000	3,700	10,000	8,700	7,100	5,000
6	6,000	4,500	12,000	10,400	8,500	6,000

TABLE S-22. -- SYNTHETIC WEB SLINGS
-- 1,000 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Endless slings, type V					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,600	1,300	3,200	2,800	2,300	1,600
2	3,200	2,600	6,400	5,500	4,500	3,200
3	4,800	3,800	9,600	8,300	6,800	4,800
4	6,400	5,100	12,800	11,100	9,000	6,400
5	8,000	6,400	16,000	13,900	11,300	8,000
6	9,600	7,700	19,200	16,600	13,600	9,600

TABLE S-22. -- SYNTHETIC WEB SLINGS
-- 1,000 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Return eye slings, type VI					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	800	650	1,600	1,400	1,150	800
2	1,600	1,300	3,200	2,800	2,300	1,600
3	2,400	1,950	4,800	4,150	3,400	2,400
4	3,200	2,600	6,400	5,500	4,500	3,200
5	4,000	3,250	8,000	6,900	5,650	4,000
6	4,800	3,800	9,600	8,300	6,800	4,800

Appendix 6: Table S-23 Synthetic Web Slings

Table S-23

Rated Capacity in Pounds Synthetic Web Slings 1,200 Lbs. Per Inch of Width Single Ply

Sling body width, inches	Triangle -- Choker slings, type I: Triangle -- Triangle slings, type II: Eye and eye with flat eye slings, type III: Eye and eye with twisted eye slings, type IV					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,200	900	2,400	2,100	1,700	1,200
2	2,400	1,800	4,800	4,200	3,400	2,400
3	3,600	2,700	7,200	6,200	5,100	3,600
4	4,800	3,600	9,600	8,300	6,800	4,800
5	6,000	4,500	12,000	10,400	8,500	6,000
6	7,200	5,400	14,400	12,500	10,200	7,200

TABLE S-23. -- SYNTHETIC WEB SLINGS
-- 1,200 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Endless slings, type V					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,900	1,500	3,800	3,300	2,700	1,900
2	3,800	3,000	7,600	6,600	5,400	3,800
3	5,800	4,600	11,600	10,000	8,200	5,800
4	7,700	6,200	15,400	13,300	10,900	7,700
5	9,600	7,700	19,200	16,600	13,600	9,600
6	11,500	9,200	23,000	19,900	16,300	11,500

TABLE S-23. -- SYNTHETIC WEB SLINGS
-- 1,200 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Return eye slings, type VI					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	950	750	1,900	1,650	1,350	950
2	1,900	1,500	3,800	3,300	2,700	1,900
3	2,850	2,250	5,700	4,950	4,050	2,850
4	3,800	3,000	7,600	6,600	5,400	3,800
5	4,750	3,750	9,500	8,250	6,750	4,750
6	5,800	4,600	11,600	10,000	8,200	5,800

Appendix 7: Figure S-24

Table S-24

Rated Capacity in Pounds Synthetic Web Slings 1,600 Lbs. Per Inch of Width Single Ply

Sling body width, inches	Triangle -- Choker slings, type I: Triangle -- Triangle slings, type II: Eye and eye with flat eye slings, type III: Eye and eye with twisted eye slings, type IV					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,600	1,200	3,200	2,800	2,300	1,600
2	3,200	2,400	6,400	5,500	4,500	3,200
3	4,800	3,600	9,600	8,300	6,800	4,800
4	6,400	4,800	12,800	11,100	9,000	6,400
5	8,000	6,000	16,000	13,800	11,300	8,000
6	9,600	7,200	19,200	16,600	13,600	9,600

TABLE S-24. -- SYNTHETIC WEB SLINGS
-- 1,600 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Endless slings, type V					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	2,600	2,100	5,200	4,500	3,700	2,600
2	5,100	4,100	10,200	8,800	7,200	5,100
3	7,700	6,200	15,400	13,300	10,900	7,700
4	10,100	8,200	20,400	17,700	14,400	10,200
5	12,800	10,200	25,600	22,200	18,100	12,800
6	15,400	12,300	30,800	26,700	21,800	15,400

TABLE S-24. -- SYNTHETIC WEB SLINGS
-- 1,600 Pounds per Inch of Width
-- Single-Ply

[Rated capacity in pounds]

(Continued)

Sling body width, inches	Return eye slings, type VI					
	Vert.	Choker	Vert. basket	30 deg. basket	45 deg. basket	60 deg. basket
1	1,050	1,050	2,600	2,250	1,850	1,300
2	2,600	2,100	5,200	4,500	3,700	2,600
3	3,900	3,150	7,800	6,750	5,500	3,900
4	5,100	4,100	10,200	8,800	7,200	5,100
5	6,400	5,150	12,800	11,050	9,050	6,400
6	7,700	6,200	15,400	13,300	10,900	7,700

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AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The purpose of this program is to ensure the safety of all employees and contractors working for Robinson Brothers Construction, Inc. and to comply with all regulations of host clients that pertain to confined spaces.

1.1 Scope

This program covers all employees and other workers that may be involved in confined space entry. When work is performed on a non-owned or operated site, the operator's program shall take precedence. This document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Term	Description
Competent Person	A Competent Person must perform an inspection of the trench at the beginning of each shift, after a rain storm, or whenever conditions change at the job site.
CSO	Company Safety Officer
LEL	Lower explosive limit
Shielding	Shielding is a system designed to give employees a safe work area by protecting them from collapsing material
Shoring	Shoring is a system designed to prevent cave-ins by supporting walls with vertical shores called uprights, or sheeting.
Wales	Wales are horizontal members along the sides of a shoring structure. Cross braces are supports placed horizontally between trench walls.

2.1 Responsibilities

It is the responsibility of the company to provide a basic awareness program for all employees in addition to maintaining, reviewing, and updating the program when needed.

It is the responsibility of each superintendent and supervisor to implement and maintain the procedures and steps set forth in this program. Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this program.

2.1.1 Facilities Management Supervisors

Supervisors are responsible for implementing the Trenching and Shoring Program.

Supervisors will implement the program through:

- Ensuring that work location health and safety practices related to trenching and shoring are communicated and understood through documented training,
- Establishing work unit specific procedures for equipment maintenance to comply with elements of this program,
- Enforcing health and safety procedures consistently through work specific training and following the Robinson Brothers Construction, Inc. Codes of Safe Practices,
- Including compliance with health and safety procedures as part of the annual performance evaluation,
- Encouraging employees to report safety concerns without fear of reprisal, and
- Report accidents and injuries promptly to the Robinson Brothers Construction, Inc.'s Human Resources.

a. Supervisors are also responsible for the following activities related to trenching and shoring activities:

- Creating a Standard Operating Procedure (SOP) for all trenching and shoring activities,
- Ensuring that the designated "Competent Person" has reviewed and approved the SOP for trenching and shoring activities being performed,
- Ensuring that each job is analyzed for potential hazards and controls and hazard analyses are performed for all job classifications that perform trenching and shoring activities, and
- Ensuring that each job is reviewed by the designated "Competent Person" before the trenching and shoring work commences.

2.1.2 Facilities Management Safety on Site (SOS)

SOS Representatives are responsible for:

- Completing Specific Hazard Assessments and Trench Entry and Authorization documentation provided by Robinson Brothers Construction, Inc. before entering an excavation space and assuring that identified hazards are addressed,
- Developing Standard Operating Procedure (SOP) as necessary,
- Coordinating work site specific training, as determined necessary for specific competencies related to job duties.

2.1.3 Competent Person

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.

2.1.4 Employees

Employees are responsible for following the requirements of the Trenching and Shoring Program by:

- Asking questions of their supervisors when concerned about an unknown or hazardous situation or substance,
- Reporting all unsafe conditions, practices or equipment to their supervisor,
- Keeping informed about conditions that may impact their health and safety, and
- Participating in Training Programs as required.

2.1.5 Environmental Health and Safety (EH&S) Responsibilities

The EH&S Department is responsible to:

- Assist Facilities Management to initiate the Annual trenching and shoring permit application process with California OSHA (Cal/OSHA),
- Notify the local Cal/OSHA office about all trenching and shoring activities that are about to occur either via telephone or in writing,
- Assist Facilities Management in renewing the trenching and shoring annual permit with Cal/OSHA, and
- Maintain and update the Trenching and Shoring Program on an annual basis or when conditions on the site and facilities change.

3.0 SAFETY

3.1 Engineering and Administrative Controls

Robinson Brothers Construction, Inc. must use all feasible engineering and administrative controls to mitigate or minimize hazards. Where hazards still exist after application of these controls, Personal Protection Equipment must be utilized.

3.2 Provision of Protective Equipment

Robinson Brothers Construction, Inc. must provide all necessary Personal Protective Equipment (PPE) unless other arrangements are agreed on. Robinson Brothers Construction, Inc. must also provide for cleaning, laundering, or disposal of protective equipment as well as repair, maintenance or replacement of protective equipment as needed to maintain the effectiveness of protection.

3.3 Personal Protection Requirements (Specific Task)

When a specific task to be performed has inherent hazards, those personnel performing the task must be warned of the hazards and must be advised of the protective measures available to them. In conjunction with EH&S, the Facilities Management will determine the specific type of PPE that will be

required while performing specific tasks. The PPE determination will be based upon the nature of the task, the hazards involved, and if any engineering and or administrative controls have been implemented to mitigate the hazards involved.

3.4 Requirements for Protective Systems

Design Standards for Personal protective equipment must conform to NIOSH (National Institutes of Occupational Safety and Health), and MSHA (Mine Safety and Health Administration) standards, where applicable, and those in referenced to the American National Standards Institute (ANSI) publications. All personal protective equipment must be of safe design and construction for the work to be performed.

3.4.1 Maintenance

Personal protective equipment in use must be inspected daily and maintained in serviceable condition. Items issue to personal must be cleaned, sanitized as appropriate, and repaired before being reissued to another employee.

Tools and equipment must be maintained in safe operating condition. Defective equipment must be taken out of service until repaired or replaced.

3.5 Signs for Designated Personal-Protection-Required Areas

In areas where there are inherent hazards presented to all those who enter, that area must have signs warning entrants of the need for personal protection. Signs must be visible at all times when work is in progress and must be promptly removed or covered when the hazard no longer exists.

Signs must be in conformance with the latest edition of ANSI Z35.1 “Specifications for Accident Prevention Signs” and with OSHA 1910.145, “Specifications for Accident Prevention Signs and Tags” “Danger” signs must be used only where there is an imminent danger to the lives of employees or others. “Caution” Signs must be used to warn of the potential hazard and to caution against unsafe practices.

3.6 Protection of Employees in Excavations

Each employee in an excavation must be protected from cave-ins by an adequate protective system designed in accordance with design criteria listed below for:

1) Sloping and benching systems or

2) Support systems, shield systems, and other protective systems except when:

- Excavations are made entirely in stable rock, or
- Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

3.7 Excavated Spoils

Employees must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.

The employees should be protected from hazards of falling, rolling, or sliding materials or equipment. They should not be subjected to excessive forces and be installed to protect employees from lateral

loads, employees must be restricted from being in the shield when installing or removing; the shield must be designed to resist calculated trench forces.

This protection can be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

4.0 TRAINING

4.1 Personal Protection Equipment Use Training

Robinson Brothers Construction, Inc. personnel (Facilities Maintenance or contractors) required to wear personal protective equipment must be trained in the proper selection, fit, and use of the equipment along with the limitations of the equipment. With the assistance of EH&S, the Facilities Management will train all personnel in how to properly select, fit, use, and store PPE.

4.2 Implementation of Plan

It is the responsibility of Facilities Management and designated Competent Persons to implement this Excavations Plan:

- The designated Competent Person is responsible for continual observational safety checks of the work operations, and to enforce the safety policies and procedures.
- The designated Competent Person is also responsible for correcting any identified unsafe acts or conditions immediately upon their discovery.
- It is the responsibility of the employee to understand and adhere to the procedures of this plan and to follow the instructions of the designated Competent Person.
- It is also the responsibility of the designated Competent Person to bring to management's attention any identified unsafe hazardous conditions or acts that may cause injury to either themselves or to any other employee.
- Any changes to this Excavations Plan must be approved by the designated Competent Persons, Facilities Management, and EH&S
- Maintain and update the Trenching and Shoring Program on an annual basis or when conditions on the site and facilities change.

5.0 PROCEDURE

5.1 Before Starting Work

Verify the location of underground utilities. Consult General Contractor information and/or call Underground Service Alert (USA) for Northern California at 811.

Except for emergency repair, notify all Regional Notification Centers or underground facilities owners two **(2) days** before the start of work.

Robinson Brothers Construction, Inc. CSO will verify that no conditions exist which will expose employees to moving ground in or adjacent to the excavation or trench.

All surface encumbrances (trees, boulders, poles, etc.) which could create a hazard for workers shall be removed or supported as necessary to safeguard employees.

Support systems must be installed for foundation bases or footings or for sidewalks, pavement, or secondary structures below which the excavation or trench will be dug (unless the excavation or trench is in solid rock or a registered professional engineer has determined such supports are not necessary).

Inspections of all excavations or trenches, adjacent areas, and protective systems will be conducted by the qualified person at the start of each shift and throughout the day as necessary.

5.1.1 Protection must be provided for adjacent structures:

- Tested for possible oxygen deficiency or hazardous atmospheres when there is a potential they exist.
- The excavation or trench must be certified safe to enter by the qualified person.

All excavations or trenches greater than 4 feet in depth shall be equipped with stairways, ladders, ramps or other safe means of worker egress requiring no more than 25 feet of lateral travel for any worker in the excavation or trench.

A trench is deeper than it is wide but no more than 15 feet wide at the bottom. Excavation, on the other hand, can be wide like a high-rise basement or one sided like a burrow pit. Trench protection is required in any excavation 5 feet or more deep.

All excavations and or trenches greater than 5 feet in depth must be equipped with cave-in protective systems sloping or benching as required by the California Construction Safety Orders. The protective system shall have the capacity to withstand all intended or foreseeable loads without failure.

Exceptions: Excavations or trenches do not need to be equipped with protective systems if they are either:

1) In solid rock, or

2) Are less than 5 feet in depth, and the qualified person verifies there is no potential for a cave-in.

5.2 Water Accumulation and Excavations

Accumulation of water within an excavation can signal serious problems even if the excavation appears to be safe and stable. Employees shall not work in Excavations in which water is or has already accumulated. Employees must be protected from water accumulation, including the use of shields, and must be inspected by a competent person before work begins. Personnel shall be removed from any excavation where water begins to accumulate.

No work may proceed until precautions are taken to protect the workers from cave-ins and from hazards associated with the water itself (i.e., electrical equipment in wet locations). Such protections will vary with the situation at hand but may include special shoring, shielding, water handling equipment, etc.

If water is controlled or prevented from accumulating by the use of water removal equipment (pumps, hoses, etc.) the water removal equipment and operations shall be monitored by Robinson Brothers Construction, Inc. CSO to ensure proper operation.

5.3 Access Control and Other Hazards

Workers will be ordered out of any excavation or trench where the qualified person determines possible cave-in, hazardous atmosphere or other hazardous condition exist. Workers will not be permitted to re-enter the excavation or trench until the hazardous condition is identified and corrected. Equipment and excavated materials must be kept at least 2 feet from the edge of the excavation or trench.

Employees are protected against potential falling loads and are not permitted to work under loads of digging equipment were loads may fall.

Employees exposed to vehicular traffic must be protected from traffic and must wear warning vests or other suitable high visibility garments. Where mobile equipment approaches the edge of excavation (i.e., loaders providing backfill, etc.), a system will be provided to prevent the equipment operator from over running the excavation. Depending on the situation, this may be accomplished by using barricades or stop-logs. Whenever possible, the grade should slope away from the excavation in these situations.

Where employees are required or permitted to cross over excavations over 6-feet in depth and wider than 30 inches, walkways or bridges with standard guardrails shall be provided.

5.4 Hazardous Atmospheres

Hazardous Atmospheres are possible due to the proximity of hazardous materials storage or land use such as landfills or animal waste lagoons, the atmosphere in an excavation will be tested before entry of any excavation deeper than 4 feet deep. Tests will be conducted for Oxygen, LEL, and any other recognized or possible atmospheric hazard. Tests should be conducted for air contaminants (oxygen, flammable gases, etc. and provide ventilation where necessary.

5.5 Ventilation

Ventilation may be utilized to clear and control levels of these atmospheric hazards with the addition of constant air quality monitoring to assure the adequacy of the protection provided by said ventilation.

NOTE: Oxygen shall be maintained as close to 21% of air and shall not be allowed to drop below 19.5% without evacuation of the excavation.

5.6 Rescue Equipment

Rescue Equipment appropriate for the situation shall be provided on site and attended whenever employees are required to enter excavations where air quality may be a problem or if entering bell-bottom pier holes or other similar deep and confined footing excavations. Such equipment may include basket stretchers, harness, and lifeline or other such retrieval equipment.

5.7 Internal combustion engines

Internal combustion engines shall not be operated in excavations or shafts without adequate ventilation. Air monitoring shall be conducted as long as such operations continue. Oxygen levels, as well as Carbon Monoxide levels, shall be monitored.

5.8 Classifying the Soil

Soil testing may indicate the need for protection in excavations less than 5 feet deep. The type of soil influences the stability of a trench; therefore Robinson Brothers Construction, Inc. CSO must classify the soil and installation of adequate protective devices before anyone enters a trench or excavation.

The Robinson Brothers Construction, Inc. CSO has enough training to identify soil types and other excavation hazards and have the Authority to take prompt corrective action.
Soil Types Are Identified as Follows (CAL/OSHA Appendix A to Section 151.1):

a. Soil Type A- The Most Stable:

- Clay,
- Silty clay, and
- Hardpan resists penetration.

b. Soil Type B-Is Medium Stability:

- Silt,
- Sandy Loam,
- Medium Clay and Unstable dry rock.

c. Soil Type C-Is Least Stable:

- Gravel,
- Loamy Sand,
- Soft Clay,
- Submerged Soil or Dense,
- Heavy, and
- Unstable rock.

Stable Rock-Excavating makes this soil unstable, (in practice, you never work in this kind of rock).

5.9 Soil Qualities

Several soil qualities may be assessed in addition to the type. These qualities are:

- Grain size
- Saturation
- Cohesiveness
- Unconfirmed compression strength

If a grain of soil is larger than a pencil lead, it is gravel. If smaller than gravel, it is sand. A naked eye can see particles of clay and silt. Four different grain sizes are:

- Gravel
- Sand
- Silt
- Clay

5.10 Saturation

Saturation refers to how much water is in the void between the grains when voids fill with water, the soil is saturated. When voids fill with air, the soil is often dry. A certain amount of water makes the soil stable, but too much or too little water causes cave-ins.

5.10.1 Cohesion or Stability

Cohesion or stability refers to how well the grains hold together. It predicts how well the trench wall will hold together and whether or not trench protection is required.

5.10.2 Unconfined Compression

Unconfined compression strength refers to how soil reacts under pressure – as measured by the amount of weight per square foot required to collapse a sample.

5.10.3 To Classify Soil

Robinson Brothers Construction, Inc. CSO needs to conduct both visual and manual tests to classify the soil.

5.10.4 Visual Testing Clues

Examine the soil particles size and type (a mixture of different types):

- If the soil clump when dug it could be clay or silt.
- Cracks in walls and spacing can mean soil types ‘B’ or ‘C.'

Layered systems with adjacent hazardous areas such as building, roads, and vibrating machinery. May require a professional engineer for classification.

If standing water or water seeping through trench walls it is classified as soil type ‘C.'

5.11 Manual Testing

Manual soil tests are required before protective system is selected
Take a sample from the soil dug out into a spoil pile and test as soon as possible to preserve its natural moisture. Test soil either on site or offsite.

5.11.1 Sedimentation Test

A Sedimentation test determines how much silt and clay are in the sandy soil. Place saturated sandy soil in a straight sided jar with about 5 inches of water. After the sample is thoroughly

mixed and allowed to settle, the percentage of sand will be visible. This data is used to classify the soil. For example, a sample with 80% sand will be classified type 'C.'

5.11.2 Wet Shaking Test

The Wet Shaking test is another way to determine the amount of sand versus clay and silt in a soil sample. Shake a saturated sample in your hand to gauge soil permeability based on the following facts:

- Shaken clay resists water movement through it.
- Water flows freely through sand and less freely through the silt.

5.11.3 Thread Test

A Thread test determines cohesion. A representative soil sample is rolled between the palms of the hands to 1/8" diameter and several inches in length. The rolled piece is placed on a flat surface and then picked up. If a sample holds together for two inches, it is considered cohesive.

5.11.4 Ribbon Test

A Ribbon test determines cohesion and is used as a backup test. A representative soil sample is rolled out (using the palm of your hands) to $^{3}/_{4}$" in diameter, and several inches in length. The sample is then squeezed between thumb and forefinger into a flat, unbroken ribbon 1/8" to $^{1}/_{4}$" thick, which is allowed to fall over the finger. If the ribbon does not break off before several inches are squeezed out, the soil is considered cohesive.

5.12 Determination of Soil Type

The determination of soil types & special considerations must be done in specific measures. Shoring, sloping, shield & excavation as needed. Timber shoring, aluminum hydraulic shoring must be determined according to the appendixes A & C of the standard. The devices should be used while in good repair & maintenance; if damaged, they must be inspected.

5.13 Protective Systems

Once the soil is classified, chose the right protective system. This choice is based on both soil classification and site restrictions.

The two main types of systems are:

- Sloping or benching
- Shoring or shielding

5.13.1 Sloping or Benching

Sloping or benching, are protective measures that cut the walls of an excavation back at an angle to the floor.

5.13.2 Sloped System

A sloped system is angle cut.

5.13.3 Bench System

A bench system is one or more steps carved into the soil. The angle used for sloping or benching is a ratio based on the soil classification and site restrictions. In both systems, the flatter the angle the greater the protection provided for workers.

A. Ratio for Type a Soil-75:1

For 1 inch. Vertical Rise, the trench wall must be cut back $^{3}/_{4}$'.

B. Ratio for Type B Soil-1:1

Each step has an equal Horizontal and Vertical Rise. Only cohesive Type B soil may be benched.

C. Ratio for Type C Soil-1.5:1

Trench wall must be cut back 1 $^{1}/_{2}$' for every 1' vertical rise. Due to instability, Type C soil is not benched.

5.14 Shoring and Shielding

Shoring and Shielding is two protective measures that add a support structure to an existing excavation (with or without sloped or benched soil). Installation and removal of those support systems are safest when done from outside the trench.

5.14.1 Shoring

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

A pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

5.14.2 Shielding

Shields used in trenches are trench boxes or trench shields. They can be pre-manufactured or job-built under the specifications of a registered professional engineer. Shields are usually portable steel structures placed in the trench by heavy equipment.

Note: For other systems, please refer to CAL/OSHA 1541.

5.15 Hazardous Underground Installations

Only qualified persons may perform subsurface installation location activities. Refer to *SB 1359 Reforms Procedures for locating Hazardous Underground Installation* for more information concerning Hazardous Underground Installations.

Note: A change to the *Construction Safety Orders 1541* requirements concerning Hazardous Underground Installations is reflected above.

The change requires if an excavation is purposed within 10 feet of a high-priority subsurface installation (High-Pressure Natural Gas, Petroleum, Pressurized Sewage or Hazardous Materials Pipelines and High Voltage Lines) the excavator shall notify the facility owner and operator the two parties will meet to decide the best way to verify the line location.

Employees who are involved in the excavation operation are exposed to excavation operation hazards shall be trained in the excavation notification and excavation practices required by CSO 1541 and government code section 4216 through 4216.9.

If damage results in the escape of any flammable, toxic or corrosive gas, liquid or endangers life, health or property, the excavator responsible shall immediately notify 911 and the facility owner/operator.

Note: For shoring, sloping and benching systems, See *Title 8, California Code of Regulations, Sections 1541 through 1547*, which will be strictly followed.

5.16 Five Steps to a Safe Excavation

1. **Survey and Mark:**
   Survey the proposed excavation areas and mark the dig site with white chalk.
2. **Call Before You Dig:**
   Call Underground Service Alert (USA) by dialing #811 (between 2 and 14 working days) before you dig or move earth in any way.
3. **Wait the Required Time:**
   Allow the utilities at least two (2) working days to locate and mark their lines. (Must call every 28 days to keep number active.)
4. **Respect the Mark:**
   Maintain the marks and follow them when digging.
5. **Dig with Care:**
   Hand excavation within 24 inches of the outside diameter of the underground line.

Note: The law requires you to notify **Pacific Gas and Electric Company** immediately at 1-800-743-5000 if you contact, scrape, dent, nick, or otherwise damage any gas or electric line**.**

6.0 RECORDKEEPING

The following requirements apply to the maintenance of Trenching and Shoring.

- Excavation, Trenching, and Shoring Checklists shall be maintained for at least one year by the Robinson Brothers Construction, Inc. and shall be available for inspection by employees and their authorized representatives.
- Training records shall include sign in sheets with each employee's name (printed), signature, ID #, and date of the training.
- This written program shall be available for all employees to review.

7.0 REFERENCES

1.	**Documents & External References** CAL/OSHA Appendix A to Section 151.1, CAL/OSHA 1541, Title 8, California Code of Regulations, http://www.infrastructureblog.com/2007/02/articles/senate-bill-1359-addresses-safety-of-construction-work-near-underground-pipelines/, Cal OSHA Title 8 Construction Safety Orders Chapter 4, Subchapter 4, Article 6, Section 1541, http://www.dir.ca.gov/Title8/sb4a6.html,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The Confine Space programs purpose is to ensure the [Robinson Brothers Construction, Inc.] is providing a safe and healthy workplace for the [companie]s' employees and contractors as well as anyone who may be exposed to the working activities of Confine Spaces while ensuring that all activity involving confined spaces complies with federal and state requirements.

1.1 Scope

The operator's program shall take precedence when work is performed on a none owned or operated site. This programs document covers the companies' employees along with their contractors and shall be utilized on owners premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Attendant	An individual stationed outside one or more permit spaces who assesses the status of authorized entrants and who must perform the duties.
Authorized entrant	An employee who is authorized by the entry supervisor to enter a permit space.
Barrier	A physical obstruction that blocks or limits access.
Confined space	Means a space that: • Is large enough and so configured that an employee can bodily enter it; • Has limited or restricted means for entry and exit; and • Is not designed for continuous employee occupancy.
Entry	The action by which any part of a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space, whether such action is intentional or any work activities are actually performed in the space.
Note to the definition of "Entry Employer". An employer cannot avoid the duties of the standard merely by refusing to decide whether its employees will enter a permit space, and OSHA will consider the failure to so decide to be an implicit decision to allow employees to enter those spaces if they are working in the proximity of the space.	
Entry permit (permit)	The written or printed document that is provided by the employer who designated the space a permit space to allow and control entry into a permit space and that contains the information specified in § 1926.1206.
Entry supervisor	The qualified person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for

	terminating entry as required by this standard.
Note to the definition of "Entry supervisor". An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this standard for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.	
Hazardous Atmosphere	An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes: 1. Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (lfl); 2. Airborne combustible dust at a concentration that meets or exceeds its lfl; **Note to paragraph (2) of the definition of "hazardous atmosphere".** This concentration may be approximated as a condition in which the combustible dust obscures vision at a distance of 5 feet (1.52 meters) or less. 3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent; 4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in subpart d of this part (occupational health and environmental control), or in subpart z of this part (toxic and hazardous substances), and which could result in employee exposure in excess of its dose or permissible exposure limit; **Note to paragraph (4) of the definition of "hazardous atmosphere".** An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this definition. 5. Any other atmospheric condition that is immediately dangerous to life or health. **Note to paragraph (5) of the definition of "hazardous atmosphere".** For air contaminants for which osha has not determined a dose or permissible exposure limit, other sources of information, such as safety data sheets that comply with the hazard communication standard, § 1926.59, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.
Hot work	Operations capable of providing a source of ignition (for example, riveting, welding, cutting, burning, and heating).
Immediately dangerous to life or health IDLH	Any condition that would interfere with an individual's ability to escape unaided from a permit space and that poses a threat to life or that would cause irreversible adverse health effects. **Note to the definition of "immediately dangerous to life or health".** Some materials-hydrogen fluoride gas and cadmium vapor, for example-may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.
Isolate or	The process by which employees in a confined space are completely protected

isolation	against the release of energy and material into the space, and contact with a physical hazard, by such means as: Blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; blocking or disconnecting all mechanical linkages; or placement of barriers to eliminate the potential for employee contact with a physical hazard.
Lockout	The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.
Monitor or monitoring	The process used to identify and evaluate the hazards after an authorized entrant enters the space. This is a process of checking for changes that is performed in a periodic or continuous manner after the completion of the initial testing or evaluation of that space.
Non-entry	Rescue occurs when a rescue service, usually the attendant, retrieves employees in a permit space without entering the permit space.
Non-permit confined space	A confined space that meets the definition of a confined space but does not meet the requirements for a permit-required confined space, as defined in this subpart.
Permit-required confined space (permit space)	A confined space that has one or more of the following characteristics: 1. Contains or has a potential to contain a hazardous atmosphere; 2. Contains a material that has the potential for engulfing an entrant; 3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or 4. Contains any other recognized serious safety or health hazard.
Permit-required confined space program	The employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.
Rescue	Retrieving, and providing medical assistance to, one or more employees who are in a permit space.
Rescue service	The personnel designated to rescue employees from permit spaces.
Ventilate or ventilation	Controlling a hazardous atmosphere using continuous forced-air mechanical systems that meet the requirements of § 1926.57 (Ventilation).

2.1 Key Responsibilities

The employer is responsible for providing their workers with a workplace that is free of serious hazards:

- The employer shall confirm that through examination of regular supervision and inspections activities performed on an annual basis; each employee is in compliance with the safety-related work practices required while working on or near energized or potentially energized equipment.
- The Robinson Brothers Construction, Inc. is also responsible for providing personal protective equipment (PPE)

2.1.1 Site Project Manager and Supervisor

The Site Project Manager and Supervisor are to ensure that employees perform in compliance with the safe work practices and the requirements in this policy plan additionally they are also responsible for:

- Verifying that every employee is trained and understand all the requirements that encompass this program
- Providing all necessary equipment as well as assuring that all employees are trained on the uses of the equipment while ensuring they comply with these requirements
- Assuring that all Confined Space Program Assessments have been completed and documented.
- Assuring that provisions and procedures are in place for the protection of employees from external hazards including but not limited to pedestrians, vehicles and other barriers and by use of the pre-entry checklist verifying that conditions in the permit space are acceptable for entry during its duration.
- Shall ensure that all Permit-Required Confined Spaces permits are posted.
- Shall ensure an annual review of the program including all entry permits issued during that annual period.
- Shall ensure that confined spaces are identified properly as either a Non-Permit Confined Space or a Permit Required Confined Space.
- Shall ensure that all confined spaces that have been identified as "no entry" will have signs that state, "DANGER DO NOT ENTER".

- Shall ensure signs have been posted at all Permit-Required Confined Space areas that state, "DANGER – PERMIT ENTRY CONFINED SPACE" along with the proper warning word such as "ASPHYXIANT, FLAMMABILITY or TOXIC HAZARD".

- Shall file all permits at the area offices for review. Permits shall be kept on file for one year.

2.1.2 Employees

- Shall attend Confined Space Entry training equivalent with their duties and when duties change as required.
- Shall comply with all aspects of this program.
- Authorized Entrants, Attendants and Entry Supervisors may be any "[Robinson Brothers Construction, Inc.]" employee that is authorized by management to work in a confined space setting and that has been trained as well as being proficient in the understanding of program requirements.

2.1.3 Authorized Entry Supervisor Duties

- Shall have a tailgate safety meeting, with all workers to be involved in the confined space entry, the job being performed will be reviewed along with any safety concerns that may be present.
- Shall confirm that all isolation, Lock/out and Tag/outs have been completed prior to entry into a confined space.
- Shall ensure that the requirements of this program are followed and maintained.
- Shall test all atmosphere conditions prior to entry and shall complete and maintain the Confined Space Permit Form, along with having it accessible for review on the job site at all times.
- Shall notify the "[Robinson Brothers Construction, Inc.]" of entry into a Confined Space, and notify the Entry Supervisor of any changes that may occur, during an entry.
- If the confined space poses a hazard that cannot be eliminated, the Entry Supervisor must arrange for a rescue services.
- If the confined space poses no hazards to the Entrants, the Entry Supervisor can reclassify the confined space to a Non-Permit Confined Space.
- A stand-by rescue team is not required to be on site for Non-Permit Confined Space entries.

2.1.4 Authorized Attendant Duties

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Is aware of possible behavioral effects of hazard exposure in Authorized Entrants.
- Continuously maintains communication along with having an accurate count of authorized Entrants in the confined space, also ensures that the means used to identify authorized Entrants, as well as accurately identifies who is in the confined space.
- Remains outside the confined space during entry operations until relieved by another Attendant.
- Attendants are NOT allowed to monitor more than one Confined Space.

Note: Attendants may enter a confined space to attempt a rescue, if they have been trained and equipped for rescue operations as required and only when they have been relieved by another Authorized Attendant.

2.1.5 Authorized Entrant Duties

- Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;
- Uses appropriate personal protective equipment properly, e.g., face and eye protection, and other forms of barrier protection such as gloves aprons, coveralls, and breathing equipment;
- Is aware of possible behavioral effects of hazard exposure in Authorized Entrants;

- Shall witness and verify calibrated air monitoring, when data is approved, sign off, before entry is made.
- Is entitled to request additional monitoring at any time.
- Maintain communication with the Attendants to enable the Attendant to monitor the Entrants status as well as to alert the Entrant to evacuate if needed; and
- When the Entrant recognizes the warning signs or symptoms of an exposure that exists, or when a prohibited condition exists, or when an alarm is activated. The Attendant or Entry Supervisor will order all to exit the confined space, exist as soon as possible.

2.1.6 Controlling Contractor

Before entry operations begin, the controlling contractor must obtain the host employer's information about the permit space hazards and previous entry operations and provide that information to each entity entering a permit space and any other entity at the worksite whose activities could foreseeably result in a hazard in the permit space. [1926.1203(h)(2)].

2.1.7 Entry Employer

Before entry operations begin the 'entry employer' must obtain related entry information from the 'controlling contractor'; inform the controlling contractor of the permit space program that they will follow. [1926.1203(h)(3)]

3.0 SAFETY

3.1 Pre-Entry Safety Meeting

The Entry Supervisor must declare when the confined space is ready for entry.

3.1.1 Pre-Entry Safety Meeting Discussion

The Entry Supervisor shall hold a pre-entry safety meeting to discuss all requirements and procedures with all Authorized Entrant(s) and Attendant(s) involved with the entry. He/she will discuss other concerns such as previous contents, vessel coating, PPE required etc., during this meeting.

3.1.2 Coordinate Entry Operations

The Entry Supervisor must coordinate entry operations when employees of more than one Robinson Brothers Construction, Inc. are working simultaneously in the confined space. This coordination is necessary so that the company's work does not endanger the employees of another company.

3.2 Protection Equipment

Check all work equipment to ensure that it has the proper safety features and is approved for the locations where it will be used. The Entry Supervisor shall ensure that all equipment is properly maintained in a safe condition and that Entrants use the equipment properly.

The following equipment must be considered and may be required when entering a confined space:

- Atmospheric Testing and Monitoring Equipment.
- Barriers, Shields, and Signs Post signs and barricades outside all Permit Required Confined Spaces to notify personnel that a confined space entry is in progress and unauthorized entry is prohibited.

- Any signs used must state “Danger Permit Entry Confined Space” along with the proper warning word such as “Asphyxiant, Flammability or Toxic Hazard”. All barricades must be capable of preventing a person from inadvertently walking into or kicking an object into the space.
- Communications Equipment – Only use Intrinsically Safe equipment in areas where a hazardous atmosphere may exist. Use a communication system that will keep the Attendant in constant, direct communication with the Entrant(s) working in the confined space. Also, use a communication system that allows the Attendant to summon help from rescue or emergency service.

a. Entry and Exit Equipment:

- (For example: ladders may be needed for safe entry and exit).

b. Lighting Equipment:

- Needed for safe entry, work within the space and exit. Lighting equipment used in the confined space must be certified safe for the location.
- Portable electric lighting used in wet and/or other conductive locations (drums, tanks, vessels) must be operated at 12 volts or less. 120 volt lights may be used if protected by a ground fault circuit interrupter.

c. Personal Protective Equipment:

- Ensure that personnel wear the required personal protective equipment (PPE). For respiratory protection requirements, refer to the Respiratory Protection Program.
- Any other equipment necessary for safe entry into and rescue from permit required confined spaces.

d. Rescue and Emergency Equipment:

- An Except if provided by outside rescue services, along with an approved first aid kit.

e. Vacuum Trucks:

- When used, trucks must be properly grounded or bonded to prevent static sparks.

f. Ventilating Equipment:

- Local Exhaust Air Movers used to obtain acceptable atmospheric entry conditions (e.g., copus air movers).

4.0 TRAINING

- Training shall be provided so that all employees whose work is regulated by this program acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them.
- Training shall be provided to each affected employee, before the employee is first assigned duties under this program, if a new hazard has been created or special deviations have occurred and before there is a change in assigned duties.
- Training records shall include employee name, trainer signature, initials, and dates of training. Training records must be made available to employees and their Authorized Representative(S)

4.1.1 The employee shall be retrained:

- Whenever there is a change in Confined Space operations that presents a hazard concerning conditions which an employee has not previously been trained to perform.
- Whenever the Entry Supervisor has reason to believe either that there are deviations from the permit space entry procedures required by this section or that there are inadequacies in the employee's knowledge or use of these procedures.

5.0 PROCEDURE

To explain safe practices for entering confined spaces and permit required for Confined Spaces, which is in compliance with regulations along with providing for the safety of all entrants. Confined Spaces include, but are not limited to underground storage bins, vaults, silos, tanks, manholes, pits, process vessels, and pipelines.

Note: Periodic monitoring can be sufficient in some situation; OSHA does not require Continuous Monitoring. However, Continuous Monitoring is always the best practice.

5.1 General Requirements

Before work begins at a worksite, each company must ensure that a Competent Person identifies all Confined Spaces in which the Robinson Brothers Construction, Inc. directs one or more employees in work, and identifies each space that is designated a permit space, through deliberation and evaluation of the elements within the space, including testing as necessary.

5.2 Non-Permit Confined Space Entry

If testing of the Confined Space atmosphere is within acceptable limits without the use of forced air ventilation and the space is properly isolated, the space can be entered by following the requirements for Level I confined space entry.

- Entrants and/or their Representative shall be given the opportunity to observe and participate in the air monitoring process.
- Entrants shall review and sign the Confined Space Permit.
- Employees may enter and work in the Confined Space as long as Lower Flammable Limit (LFL,) O2, and toxicity hazards remain at safe levels.
- Complete the “Robinson Brothers Construction, Inc.” Confined Space Entry Permit to document that there are no confined space hazards. Make this certification available to all personnel entering the space.
- A Trained Attendant must always be outside the Confined Space. The Attendant must monitor the Authorized Entrants for the duration of the entry operation.

5.2.1 Exception:

The Attendant requirements for Level I Confined Space Entry may be exempted if the job assessment is performed and has determined that there are no inherent dangers to allow single person entry.

This provision is intended to permit field operations to enter crankcases, shallow valve boxes, cellars, excavations, etc. without an Attendant being present and all other aspects of the Entry Permit Complied with:

- When there are changes in the use and configuration of a Confined Space that might increase the hazards to the Entrants (e.g., using epoxy coating on a tank floor, welding, painting, etc.), re-evaluate the space. If necessary, reclassify the space as a Permit Required Confined Space.
- Continuously Monitor the confined space atmosphere to ensure that it is still safe.
- The space must not contain a hazardous atmosphere while personnel are inside.
- If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space.
- Re-evaluate the space to determine how the hazardous atmosphere developed.
- The Entry Supervisor shall cancel the Entry Permit.
- Take action to protect personnel before any subsequent activity to re-enter the space takes place.
- Reissue the Robinson Brothers Construction, Inc.s' Confined Space Entry Permit before allowing Entrants to re-enter the space.
- If necessary, reclassify the space as a Permit Required Confined Space.
- Ensure that vehicle or other equipment exhaust does not enter the space.

5.2.2 Alternate Procedures Entering a Space Under Non-Permit Conditions

If the company is using an 'alternate procedures' to enter a space under non-permit conditions. The company must demonstrate that each of the following are conditions are satisfactorily addressed: [1926.1203(e)]

a) All physical hazards in the space are eliminated or isolated through engineering controls so that the only hazard posed by the permit space is an actual or potential hazardous atmosphere,

b) Continuous forced air ventilation is utilized to maintain safe for entry,

c) The space should have continuous monitoring unless the employer has supporting data that demonstrates continuous monitoring is unnecessary.

5.2.3 Reclassified Space

A space classified by the company as a 'permit-required' confined space may only be 'reclassified' as a 'non-permit' confined space when a competent person determines that all of the applicable requirements have been met. [1926.1203(g)]

a) Space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated or isolated without entry into the space,

b) Testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated or isolated,

c) Forced air ventilation does not constitute elimination or isolation of the hazards;

d) Document the basis for determining that all hazards in a permit space have been eliminated or isolated, and

e) Through a certification that contains the date, the location of the space, and the signature of the person making the determination.

f) If hazards arise within a permit space that has been reclassified as a non-permit space, each employee in the space must exit the space. The entry employer must then reevaluate the space and reclassify it as a permit space.

5.3 Permit Required Confined Space Entry

The 'Permit-required' confined space program shall address the following elements: [1926.1204(a)(b)(c)(d)]

a) implement the measures necessary to prevent unauthorized entry,

b) identify and evaluate the hazards of permit spaces before employees enter them,

c) develop and implement the means, procedures, and practices necessary for safe permit space entry operations, and

d) provide entry equipment at no cost to each employee, maintain that equipment properly, and ensure that each employee uses that equipment properly.

The 'Permit-required' confined space program shall provide for 'permit required' pre-entry testing, periodic monitoring, provide an early-warning system that continuously monitors for non-isolated engulfment hazards, and continuously monitor atmospheric hazards. [1926.1204(e)]

If the company decides that the affected employees will enter a permit space, the company must have a written permit space program implemented and available at the construction site. [1926.1203(d)]

The 'Permit-required' confined space program shall address the content of the 'permit required' entry permit. [1926.1206]

a) Space to be entered

b) Purpose of the entry

c) Date and the authorized duration

d) Names of authorized entrants

e) Means of detecting an increase in atmospheric hazard levels in the event the ventilation system stops working

f) Names of entry attendants;

g) Name & signature of entry supervisor

h) Hazards of the permit space to be entered

i) Measures used to isolate the permit space and to eliminate or control permit space hazards before entry

j) Acceptable entry conditions

k) Results of tests and monitoring performed {names or initials of the testers and by an indication of when the tests were performed}

l) Rescue and emergency services that can be summoned and the means {such as the equipment to use and the numbers to call}

m) Communication procedures used by authorized entrants and attendants to maintain contact during the entry

n) Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided

o) Any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

If the space is properly isolated and results of air monitoring are above acceptable parameters without local exhaust ventilation in operation, classify the entry as a Permit Required Confined Space.

- Complete the company's Confined Space Entry Permit before proceeding with work in a Permit Required Confined Space.
- Entrants and/or their Representative shall be given the opportunity to observe and participate in the air monitoring process.
- Entrants shall review and sign the Confined Space Permit.
- At least one Trained Attendant must always be outside the Permit Required Confined Space.
- The Attendant must monitor the Authorized Entrants for the duration of the entry operation.
- Only Authorized Entrants may enter a Permit Required Confined Space.
- All Entrants must sign in and out on the Entry Permit when entering and leaving a Permit Required Confined Space.
- The back of the permit or a sign in sheet must be used for this purpose.
- Post signs and barricades outside all Permit Required Confined Spaces to notify personnel that a confined space entry is in progress and Unauthorized Entry is prohibited.
- Conditions must be Continuously Monitored where Entrants are working to determine that acceptable conditions are maintained during entry.

a. If a hazardous atmosphere is detected during an entry, personnel must immediately evacuate the space:

- The Entry Supervisor shall cancel the entry permit.
- Re-evaluate the space to determine how the hazardous atmosphere developed.
- Take action to protect personnel before any subsequent activity to re-enter the space takes place.
- Re-issue the Robinson Brothers Construction, Inc.'s Confined Space Entry Permit before allowing Entrants to re-enter the space.
- Employees or their Representatives are entitled to request additional monitoring at any time.
- The permit must be terminated when the entry operations are complete or when permit conditions change (i.e., hazardous air monitoring results are noted, unsafe behaviors are observed, etc.).
- The minimum rescue equipment required for Permit Required Confined Space entry is covered in the Rescue & Emergency section of this program.

- Permit, required Confined Space entry operations will be reviewed when the company believes that the requirements of this confined space program may not adequately protect personnel.
- If deficiencies are found in the program, the program will be revised and personnel will be trained in the new revisions before subsequent entries are authorized.

5.4 Pre-Job Planning and Space Preparation

- The Entry Supervisor must determine that the confined space is properly isolated by blinding, disconnecting, and/or by following local Lockout/Tagout procedures.
- The Entry Supervisor must discuss with all Entrants the hazards of the space, communication methods and emergency procedures during the confined space entry.
- Eliminate any condition making it unsafe to open the equipment to atmosphere.
- Promptly guard the opening to prevent an accidental fall through the opening and to protect each employee working in the space from foreign objects entering the space.
- If applicable, wash, steam, ventilate or degas the confined space to properly free it of possible contaminants. Vent vapors to a safe location.
- Do not allow unauthorized personnel to enter a confined space. Barricade and/or guard all confined spaces to prevent entry of unauthorized Entrants.
- If performing hot work in the confined space, precautions must be taken consistent with the Robinson Brothers Construction, Inc.s' Hot Work Permit procedure.
- Ensure that vehicles or other equipment exhaust does not enter the space

5.5 Air Monitoring

Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct reading instrument, for:

- Oxygen content, flammable gases, vapors, and potential toxic air contaminants, in that order
- Monitoring of the space must inform the Entrants of the potential hazards and results and they must participate in the permit review and signing.
- Air shall be periodically test while continuous ventilation is applied.
- Any employee, who enters the space, or that employee's Authorized Representative, shall be provided an opportunity to observe the pre-entry testing required.
- Employees or their Authorized Representative are entitled to request additional air monitoring at any time.

5.6 Ventilation

Continuous forced air ventilation must be used and tested as follows:

- An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere,
- The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space,

- The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- The atmosphere within the space shall be Continually Tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.
- Any employee, entering the space, or that employee's Authorized Representative, shall be provided with an opportunity to observe the Continually Testing and may request additional monitoring at any time.
- If a hazardous atmosphere is detected during entry each employee shall leave the space immediately and the space shall be evaluated to determine how the hazardous atmosphere developed, and
- Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
- Effective measures must be taken to prevent employees from entering a permit space, if the company identifies, or receives notice of, a permit space and has not authorized employees they are directing to work in that space. In addition to complying with all other applicable requirements of this standard.

5.7 Multiple Employer Procedure

In order ensure safety the employees of any other employer, the Entry Supervisor shall:

- Verify that all contractor employees have been trained in confined space and that all contractor employees fully understand the "Robinson Brothers Construction, Inc." procedures pertaining to Confined Space.
- Inform the contractor that the workplace contains Permit Spaces and that Permit Space entry is allowed only through compliance with a Permit Space Program meeting the requirements of this section.
- Apprise the contractor of the elements, including the hazards identified and the employees experience with the space, that make the space in question a Permit Space.
- Inform the contractor of any precautions or procedures that Robinson Brothers Construction, Inc. has implemented for the protection of employees in or near Permit Spaces where contractor personnel will be working.
- Coordinate entry operations with the contractor, when both of the companies' personnel and contractor personnel will be working in or near confined spaces

5.7.1 Debrief at Conclusion

Debrief the contractor at the conclusion of the entry operations regarding the Permit Space Program that's followed, and regarding any hazards confronted or introduced in the Confined Spaces during entry operations. In addition to complying with the Confined Space requirements that apply to all employees; each contractor, who is retained to perform Permit Space Entry Operations, shall:

- Obtain any available information regarding the Confined Space hazards and entry operations from the Robinson Brothers Construction, Inc.s' Entry Supervisor.
- Coordinate entry operations with the Robinson Brothers Construction, Inc.s' Entry Supervisor, when both company personnel and contractor personnel will be working in or near Permit Spaces.

- Inform the company of the Confined Space Program that the contractor will follow and of any hazards confronted or introduced in the Confined Space, either through a debriefing or during the entry operation.

5.8 Permit Space Entry Communication and Coordination

The 'host employer' entry communication and coordination responsibilities before entry operations begin. (The 'host employer' must provide the following information, to the 'controlling contractor': [1926.1203(h)(1)]

a) Location of each known permit space,

b) Hazards or potential hazards in each space, and

c) Precautions that the host employer or any previous controlling contractor or entry employer have implemented for the protection of employees in the permit space.

5.9 Rescue and Emergency Services

The Rescue and Emergency Services aid if a situation arises where a hazardous condition is introduced and the worker does not leave or is unable to leave the confined space, rescue procedures should begin immediately.

5.9.1 General:

- If entry is to be made into an IDLH atmosphere, or into a space that can quickly develop an IDLH atmosphere (if ventilation fails or for other reasons), the Trained Rescue Team or Rescue Service must be standing by at the Permit Space while work is being performed.
- In case of an emergency and/or injuries, the Permit Space site shall be secured and Emergency Response Personnel shall be notified to respond per the host facility emergency plan.
- If there is reliance on the Host Facility or Outside Services for rescue the Host Facility or Outside Services Team must be given an opportunity to examine the entry site, practice rescue and decline as appropriate.
- Reliance on Host Facility for rescue services must be stated and agreed to in contract language.
- The Attendant shall order the other Entrants not to move the injured nor allow Untrained or Unauthorized workers into the space that are not trained to handle a Confined Space Rescue.
- Material Safety Data Sheet's for substances that an injured Entrant was exposed to must be provided to the medical facility treating the injured worker.

5.9.2 Permit Required Confined Space Rescue:

- When the Attendant becomes aware of the need for rescue, the Attendant shall immediately summon the onsite rescue team by the agreed upon communication method, verbally, radio or cell phone, without leaving the vicinity of the Confined Space.
- The Attendant shall prevent Unauthorized Personnel from attempting a rescue.
- After the rescue team has been notified, the Attendant shall alert the Entry Supervisor of the emergency via the same communication methods.

- The preferred means of providing rescue service is through the use of a Qualified Outside Rescue Service Vendor.

  a. The outside Rescue Service Vendor must be:

  - Informed of the hazards that they may confront during a rescue,
  - Provided access to the Permit-Required Confined Space,
  - Access to the space allows the rescue service and local supervision to jointly develop appropriate rescue plans.

  b. If the "Robinson Brothers Construction, Inc." employees are to perform Permit Required Confined Space Rescues, they must be:

  - Provided with training and must be recognized as a trained employee in the use of the proper PPE necessary to make the rescue;
  - Provided with PPE at no cost and trained to perform the assigned duties,
  - Required to practice making rescues at least once every 12 months. Practice rescue is not required when the affected employees properly performed a rescue operation during the last 12 months in the same permit space the Authorized Entrant will enter, or in a similar Permit Space.
  - Trained in basic first aid and CPR.
  - A minimum of one member of the rescue team must hold a current certification in first aid and CPR.
  - If the operator is designated to provide rescue services for the company's, agreement of services must be included in contract for the job.

5.9.3 Non-entry Rescue:

- To facilitate non-entry rescue, an Entrant must be attached to a retrieval system whenever he/she enters a Permit-Required Confined Space with a vertical depth of more than 5 feet.
- The retrieval equipment is not required if it will increase the overall risk of the entry, e.g., creating an entanglement hazard, or will not contribute to the rescue of the Entrant.
- Each Entrant shall use a full body harness equipped with a "D" ring located between the shoulders or above the head.
- Wristlets may be used instead of the full body harness, if the use of the full body harness is not feasible or creates a greater hazard and that using wristlets is the safest and most effective alternative.
- The retrieval line must be attached to the "D" ring and the other end of the retrieval line.
- attached to a retrieval device or a fixed point located outside the space so that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.

5.9.4 Issuance/Reviewing of Permit:

- Only when all pre-entry requirements are satisfied, Shall the Entry Supervisor issue a completed and signed Confined Space Permit. The Confined Space Permit is valid for one

shift.

- In the event of any Unauthorized Entry, employee complaints, a hazard not covered by the permit, the occurrence of an injury or near miss the Entry Permit shall be cancelled and a review shall be conducted to provide employee protection and for revising the program prior to authorizing subsequent entries.
- An annual review of this program, using the cancelled permits retained within 1 year after each entry shall be conducted by the HSE Manager to revise the program as necessary, to ensure that employees are protected. If no Confined Space Entries were performed during a 12-month period, no review is necessary.

5.9.5 Cancellation/Closure of Permits:

- The Entry Supervisor shall cancel the confined space permit, at the end of the job operation, at the end of the shift or when the Entry Supervisor or Attendant determine that conditions in or near the confined space have changed and is hazardous to the Entrants.
- The Entry Supervisor shall, at the conclusion of entry operation, close out the permit and provide the safety department the original copy of the Confined Space Permit.

6.0 RECORDS KEEPING

The employer must maintain training records to show that the training has been accomplished. The training records must contain:

- Each employee's name
- The name of the trainers, and
- The dates of training
- Employers may perform a single annual review covering all entries performed during a 12-month period.
- If no entry is performed during a 12-month period, no review is necessary

The documentation must be available for inspection by employees and their Authorized Representatives, for the period of time the employee is employed by that employer.

7.0 REFERENCES

Document and External Refernces:
29 CFR 1926, Subpart AA—Confined Spaces in Construction, § 1926.1209, § 1926.1206, subpart D of this part (Occupational Health and Environmental Control), or in subpart Z of this part (Toxic and Hazardous Substances), Hazard Communication Standard, § 1926.59, § 1926.57 (Ventilation), Sign Illustration's from ComplianceSigns.com

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendment

9.0 APPENDICES

None

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This program is to ensure that all cranes, hoists, slings and wire rope used on Robinson Brothers Construction, Inc. offshore operated facilities are properly inspected, maintained and operated by taking into consideration the:

- Manufacturer's recommendations,
- CFR › Title 30 › Chapter II › Subchapter B › Part 250 › Subpart A › Section 250.108
- American Petroleum Institute (API) Recommended Practices in the (RP) 2D (regulatory incorporated), API RP 2D (latest edition),
- Applicable OSHA regulations, and
- Applicable U.S. Coast Guard regulations.

1.1 Scope

These guidelines pertain to all Robinson Brothers Construction, Inc. and third party/contract cranes used in conjunction with offshore operations whether operated by Robinson Brothers Construction, Inc. personnel or other (contract) personnel. These guidelines do not apply to cranes on movable offshore drilling units, derrick barges, or lay barges, with the exception of Boats and Shore-base Operations. Each contractor will be solely responsible for compliance with these requirements.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
(API) RP 2D	American Petroleum Institute (API) Recommended Practices (RP) 2D.
Crane Operator	An individual qualified through training and experience meeting requirements of API RP 2D Crane Operation and Maintenance Program.
Cargo Manifest	A shipping document that lists all **freight** or **cargo** items for a specific voyage. The **manifest** is required by customs agents when checking international shipments.
Deficiencies	Are defined as "conditions that in any way compromise the proper performance and/or safe operation of the crane."
Field Fabricated	The practice of facility personnel using materials available onsite to fashion a makeshift device (i.e. slings) instead of utilizing such a device specifically manufactured and tested by an appropriately recognized agency.
Green Deck	A request to take off or land; the ship is not maneuvering, and the bridge is aware of aircraft operations.
Load (loads)	An object that must be lifted or moved whose total weight equals that of

	the object and all tackle, wire rope and hardware used to lift or move it
Load Radius	The distance from the centerline of the crane turntable to the centerline of the load (true vertical of the load bearing hook).
Load Test	Is defined as a load that is applied to the crane structure at 125% of the crane's static rated capacity as identified on the crane's load chart. A load test is required under the following conditions: 1. New cranes being placed into service. 2. Cranes being permanently relocated. 3. Temporary cranes after each rig-up or relocation. **NOTE**: A Pre-Inspection and the Post Annual Inspection is required during Load Test process.
Overhead Hoist	A semi-portable trolley-type hoist attached to a fixed beam usually used for lifting small loads within a specific area or building.
Portable Hoist (Tugger)	A portable hoist usually attached to the platform structure used to perform lifting and/or moving of equipment in areas that preclude platform crane or overhead hoist usage.
Personnel Basket	A synthetic rope-type basket specifically manufactured for safely transferring personnel to/from boats and offshore platforms.
Pull Test	Is defined as a load that is applied to the crane structure that will not exceed 100% of the crane's static rated capacity as identified on the crane's load chart.
Rigger	An individual, qualified by training meeting the requirements of the duties of properly attaching slings, hooks, etc., to a load before a lifting or hoisting operation.

2.1 Responsibilities

2.1.1 Manager/CSO

- Implementation and compliance with this procedure.
- Ensure inspections occur daily or before the use of a crane if not used on a daily basis, documented monthly, and annually by a Third-Party Inspector.
- Are responsible for identifying hazard areas by marking the boundaries of the crane swing radius with warning lines, railings or similar barriers or other safety measures to be used when the equipment has the potential to strike and injure an employee or pinch/crush an employee against any other object.
- Train all crane operators and re-train following any crane incident.
- Maintain documentation.
- Ensure operation procedures (operator's manual) must be readily available in the cab or equipment at all times.

- Ensure cranes may only be operated by certified/qualified operators.

2.1.2 Employees

- Conduct an inspection of the crane and rigging before use.
- Ensure damaged or defective cranes must be removed from service immediately.
- Ensure loads are lifted according to this procedure.

2.1.3 Crane Operator

All crane operators shall read and understand these guidelines:

- The crane operator is responsible for all crane operations including rigging practices, mechanical integrity of the crane, the equipment used, "in other words," slings, shackles "for example," and the decision to proceed with lifting operations.
- The crane operator is responsible for performing the Pre-Use and Monthly inspections and/or subsequent inspections and assuring that all rigging equipment is sound and tagged (certified) as required.
- The crane operator shall designate or identify the riggers and signal personnel to enhance communications and reduce confusion.
- A pre-operation hazard assessment is performed to identify the work zone prior to conducting work.
- The crane operator shall conduct a pre-lift discussion and JSA with all personnel involved with the upcoming lifting operation and assure that all riggers are qualified.

a. While operating the crane, the crane operator shall:

- Take into consideration weather and sea conditions and check the appropriate static and dynamic lift charts to determine if the load can be lifted safely.
- Not operate the crane if unable to do so safely ("for example," due to illness, taking medication, etc.).
- Not exceed the limitations imposed by safety devices ("for example," boom kick-outs) or structural constraints ("for example," safe boom angles for a given weight).
- Have the authority to stop the operation if unsafe conditions develop.

2.1.4 Overhead/Portable Hoist Operator

- All hoist operators must read and understand these guidelines before operating an overhead/portable hoist.
- The hoist operator is responsible for all hoist operations including rigging practices, the mechanical integrity of the hoist, the equipment used, and the decision to proceed with lifting/tugging operations.

2.1.5 Qualified Crane Service Technicians shall conduct the following:

- Quarterly Inspections
- Annual Inspections

- Hydraulic System Repairs / Changes ("in other words," filter changes, hose changes, control valve linkage repair)
- Boom section replacement including heel pins
- Winch and Wire Rope Replacements
- Pedestal bearing repair
- Control valve service
- Mechanical (preventative) inspections and maintenance shall be performed in accordance with API RP 2D & API SPEC 2C and utilize the manufacturer's recommendations when needed.
- Welding repairs shall be made to critical components, such asbooms and swing circle assemblies, specific repair procedures and recommendations from the original Crane Manufacturer. Other qualified source (such as an API RP 2D & API SPEC 2C – licensed Offshore Crane manufacturer, Authorized Surveyor, or an Engineer experienced in the design of the crane, as determined by the Crane Owner).
- Care should be taken to ensure that arcing does not occur across any bearings.
- Crane repairs shall not be conducted without Crane Maintenance Foreman approval.

3.0 SAFETY

3.1 Modifications of Equipment

The manufacturer must approve all modifications/additions in writing. A registered professional engineer must be qualified with respect to the equipment involved, and must ensure the original safety factor of the equipment is not reduced.

3.1.1 Personal Protective Equipment

Management has an obligation to provider personal protective equipment (PPE) to employees such as:

- The PPE provided should include equipment for the eyes, face, head, and extremities.
- Protective clothing and barriers should also be provided. The employer should make sure employees use and maintain PPE in a sanitary and reliable condition.
- Defective or damaged personal protective equipment should not be used.
- It's important to inspect PPE regularly, and before each use to make sure it's capable of adequately protecting an employee from exposure to hazards. Remember, PPE that is defective is not PPE.

3.1.2 Hazard Assessment and Equipment Selection

A hazard assessment should be conducted prior to the use of PPE because it produces the information needed to select the appropriate PPE for any hazards present or likely to be present while performing work.

It is a performance-oriented provision that simply requires management to use their awareness of workplace hazards to enable them to select the appropriate PPE for the work being performed.

4.0 TRAINING

4.1 API RP 2D Training Requirements

- Crane operators must attend and pass a training course based on the requirements contained in *API RP 2D* before they can be issued an *Initial Qualification Card*. Appropriate refresher training will be conducted at a minimum of every (4) years. If cranes are operated by contract personnel, the contractor's employer will be responsible for verifying the following training requirements and other criteria are met during the crane operator qualification process.
- Rigger training as outlined in *API RP 2D*.
- A written test which attendees must pass in order to obtain *Crane Operator Qualification and Rigger Qualification.*

4.2 Crane Operator Training and Qualifications Program

Before a Crane Operator can operate a Robinson Brothers Construction, Inc. crane, he or she must meet the requirements and *successfully complete the Robinson Brothers Construction, Inc. Crane Operator Training and Qualifications Program. The Robinson Brothers Construction, Inc. Crane Operator Training and Qualifications Program* will be administered by a *Qualified Instructor* and will consist of the following:

- Verify crane operator possesses a valid *API RP-2D Qualifications Card* as stated in this program.
- Complete review and training of Robinson Brothers Construction, Inc.'s *Offshore Crane Operation and Maintenance Program*.
- Acknowledgment sheet at the beginning of this program shall be signed by the operator and filed on the facility. A log of the employee's acknowledgments shall be maintained by the qualified instructor.
- A test and a hands-on evaluation of each candidate's operating proficiency shall be administered by a Robinson Brothers Construction, Inc. approved *Qualified Instructor* on the type of crane (hydraulic, mechanical or both) to be operated by that candidate. Based on the results of the hands-on evaluation, operation experience, and classroom test results, the operator will be classified as follows:

Crane Operator Classification Table

Class	Operating Limitations
Class A	No limitations except those imposed by the weather, seas or other unsafe
Class B	• May not lift over 75% of the rated crane capacity at any given angle. • May be limited to certain conditions imposed by the weather and/or sea state.
Class C	• Must be under direct supervision (within arm's length) of a Class A or B Crane Operator. • May not lift more than 50% of the rated crane capacity at any given angle. • May be limited to certain conditions imposed by the weather and/or sea state. • MAY NOT LIFT PERSONNEL. • May not perform any crane inspections (pre-use, monthly, etc.) unless under the direct supervision of a Class A or B Crane Operator.

- The Robinson Brothers Construction, Inc. *Crane Operator Classification* can be changed after the operator has been re-evaluated as per this program.

- All training and qualification records shall be maintained on the platform for each *Qualified Crane Operator.*
- Special projects or call out crane operators that are contracted to operate cranes shall have a minimum of 5 years of crane operating experience and must meet the above criteria.

4.3 Rigger Training Requirements

- All "Riggers" (whether a company employee or contractor) must have knowledge of the basics of safely rigging loads through an approved *API RP-2D* structured rigging school and experience. This training should be equivalent to the rigger orientation required of certified crane operators.
- Load rigging practices must follow all *API* recommendations and standard industry procedures.
- Anyone serving as a "Rigger" shall have attended an approved *API RP-2D* structured rigging school and read and be familiar with *(Section 6.3 6.3) Slings*. This shall include riggers on board crew boats or supply boats where loads from platform cranes are being rigged for loading and unloading.

4.4 Suspension of the Ability to Operate a Robinson Brothers Construction, Inc. Crane

a. An employee or contractor shall be suspended from operating a Robinson Brothers Construction, Inc. crane if any of the following conditions occur:

- Expirations of his or her *API RP-2D Qualifications Card* (every 4 years)
- Physical/medical condition has changed which may impair his or her operations
- Poor or unsafe operations of a crane.

5.0 PROCEDURE

To set guidelines for the safe operation, maintenance and inspection of all offshore cranes and associated equipment (including criteria for overhead/portable hoists and load rigging practices) to assure safe operation and mechanical integrity.

5.1 Stop Work Authority

- It is Robinson Brothers Construction, Inc.'s policy that all employees have the right and duty to refuse to perform any task that they do not completely understand or may feel unsafe.
- All employees also have the authority to stop all work being performed by other employees if they perceive the work is unsafe.
- Once a *Stop Work Authority* (SWA) has been initiated no work will be resumed until all the issues have been addressed.
- The operator may refuse to lift a load if there is a safety concern.
- The employee will not be reprimanded for refusal to perform unsafe tasks or utilizing the SWA.

5.2 Operating Practices, Procedures, and Requirements

Crane operation is a privilege by qualification, not a right of employment. Rejection and/or cancellation of a "Qualified Operator" status is at the discretion of Robinson Brothers Construction, Inc..

5.2.1 Crane Equipment

Except for maintenance personnel performing maintenance duties, no personnel shall operate a crane on a company operated facility unless they have a valid and current *Crane Operator Qualification Card* issued through an approved third-party trainer.

All Crane Operators will also be required to read, understand and follow this Robinson Brothers Construction, Inc. *Offshore Crane Operation and Maintenance Program.* All operations, including maintenance operations, shall be conducted in a safe manner. At a minimum, this shall include the following:

- The crane operator shall perform a *Pre-Use Inspection* prior to the first crane use of the day, and prior to or during each change in operator or as the qualified operator deems necessary.
- Also during the day for extended operations or changes requiring a revision to the Job Safety Analysis (JSA) affecting crane operations.
- Lift cables shall not be wrapped around the load (slings, chokers or other rigging equipment must be used).
- There shall always be a minimum of half (1/2) a layer of cable left on the bottom layer of the auxiliary and load winch cable drums.
- Also, a minimum of three-quarters (3/4) of a layer of cable left on the bottom layer of the boom winch cable drum at its lowest operational point (i.e., crane boom at horizontal with bridle and boom in tension, or headache ball/load block at water level).
- Required crane safety devices (i.e., anti-two blocking mechanisms on hoist lines, high and low boom angle shutdowns) shall be functioning properly whenever the crane is in operation. The exception to this requirement is whenever the crane is being operated for the purpose of repairing one or more of the safety devices.
- Main hoist lines shall not be twisted around each other.
- A crane file shall be kept on board for the purpose of maintaining records of inspections, maintenance, and usage. A minimum of four years shall be available.
- A crane's basic configuration (e.g., boom length, wire rope size, and type, etc.) shall not be changed without permission from the Maintenance Foreman or Superintendent.
- All lift cables/wire ropes and slings shall be inspected for condition, adequate lubrication, and appropriate certification tags.
- Helicopter warning lights are required to be installed on all manned facilities where the crane boom could reach the heliport and interfere with helicopter operations. The warning light should be installed at the Crane Gantry or other location where the light is clearly visible to all approaching or departing aircraft.

5.3 Operating Practices

Except for maintenance personnel performing maintenance duties, no personnel shall operate a crane on a company operated facility unless they have been trained by an approved third-party instructor. All Crane Operators will also be required to read, understand and follow Robinson Brothers Construction, Inc.'s Offshore Crane Operation and Maintenance Program. All operations, including maintenance operations, shall be conducted in a safe manner. At a minimum, this shall include the following:

- A Pre-Use and Monthly Inspection will be performed by the crane operator regardless of usage time.

- The crane operator will become familiar with the load in respect to its weight and configuration including all special rigging used to lift it prior to making the lift.
- When determining if the fast line can be used for a lift, identify from the load chart the dynamic lifting capacity of the crane (fast line) at the lowest proposed lift angle or longest radius. If the lift exceeds 90% of the rated capacity of the fast line capacity, the fast line shall not be used.
- The crane shall not be overloaded.
- Loads shall not be moved over personnel.
- All personnel must be clear of the load before it is lifted or moved.
- Crane lifting operations may not begin until the *Crane Operator* has designated a *Qualified Signal Perso*n for all areas where the *Crane Operator's* vision is, or will be, obstructed during any part of the lift.
- Cranes shall only be operated on a firm, level ground that adequately supports the weight of the crane and loads. Before lifting, fully extend outriggers and ensure their stability on the ground.
- The crane operator and the *Signal Person(*s) must maintain direct communication with each other throughout their portion of the lift either visually or by radio. *Examples of situations requiring two signal persons would include lifts from one deck to another deck (if the signal person from one deck remained on that deck) and lifts to and from boats.*
- The *Crane Operator* shall respond to signals only from the designated *Signal Person*(s) but shall obey any "STOP" signal from anyone whenever it is given. If a stop signal is given, crane operations shall cease until the appropriate designated *Signal Person* verifies that it is safe to resume operations. When it is safe to resume operations, the appropriate designated signal person shall communicate that fact to the *Crane Operator*.
- Verify that weather and sea conditions will permit safe crane operations. This shall be determined by all parties involved (Boat Captain, Riggers, Crane Operator or other personnel). ***STOP Work Authority*** can be exercised by anyone at any time. The boom shall be properly secured in the boom rest under adverse weather conditions that are deemed to be unsafe.
- When a helicopter approaches a facility, the crane boom shall be swung away from the heliport, the swing lock shall be engaged, and the *Crane Operator* shall step out of the cab of the crane. If a lift is in progress, the lift should be completed before the crane is secured. The approaching helicopter should request a "*Green Deck*" from the facility operations personnel prior to landing.
- On lifting, the load hook shall be positioned directly over the load to avoid a side thrust on the boom and to prevent the load from swinging. The swing brake should be unlocked at this time to allow the boom to track the load.
- The crane shall not be used in a manner that may result in shock loading (for example, pulling up grating that is still welded to the platform).
- The *Crane Operator* shall inspect all boom attachments (boom load block protectors, boom walkway rub guards, etc.), during each pre-use inspection to ensure that nothing is loose and/or poses a potential fall hazard.
- Each crane operator will inspect the entire boom for cracks, bends or other deformities during the pre-use inspection.
- Platforms with cranes shall paint a red perimeter line to provide a visual indication of when the boom is approaching the boom stops.

- The boom high angle kick-out safety device is designed to automatically prevent the boom from contacting the boom stops.
- Crane Operators must not rely on boom kick out devices to establish angle limits.
- The limiting safety device or high angle kick-out can only be overridden or bypassed during crucial equipment lifting conditions and only with prior authorization from the Robinson Brothers Construction, Inc. Crane Maintenance Foreman.

5.4 Assembly and Disassembly

- Ensure that the manufacturer's specifications/instructions are followed during assembly and/or disassembly.
- A competent/qualified person must direct the assembly and/or disassembly of equipment.

5.4.1 Hand Signal Chart

- Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations, see *Appendix D***.**

5.5 Heavy Lifts

Robinson Brothers Construction, Inc.'s intention is to have every lift a "safe" lift, without incident or injury to persons or equipment. The following is the procedure to be followed in achieving this goal.

"Heavy" lifts are those whose weights are within 10% of the maximum rated Dynamic and/or Static capacity (depending on the type of lift) of the crane at any given boom angle.

5.6 Load Test and Pull Test (as per API RP 2D)

5.6.1 Load Test:

Is defined as a load that is applied to the crane structure at 125% of the crane's static rated capacity as identified on the crane's *Load Chart*, see the *National Center for Construction Education and Research* (NCCER) for applicable *Load Chart*. A load test is required under the following conditions:

1. New cranes being placed into service.
2. Cranes being permanently relocated.
3. Also, temporary cranes after each rig-up or relocation.

NOTE: A Pre-and Post Annual Inspection is required during Load Test process.

5.6.2 <u>Pull Test:</u> is defined as a load that is applied to the crane structure that will not exceed

100% of the crane's static rated capacity as identified on the crane's *Load Chart*. A pull test is conducted at the owner or owner representative's discretion. This is **NOT** a *Load Test*. When the crane owner or owner's representative elects to have, a crane pull-tested, a calibrated dynamometer or a known suspended weight should be used, and the pull test should be held for a minimum of 5 minutes. Upon completion of the *Pull Test*, a *Qualified Operator or Qualified Inspector* should perform a *Pre-Use Inspection* of the crane to assure no damage occurred during the test.

5.6.3 Qualification of Heavy Lifts

Qualification of a "Heavy" Lift:

- Identify the weight of the load to be lifted.
- Using a platform deck drawing, identify the load radius at proposed boat or platform location for the initial lift and/or the proposed boat or platform location to which the load is to be placed.
- From the load chart, identify the dynamic and/or static lifting capacity (depending on the type of lift) of the crane at the lowest proposed lift angle or longest radius.
- Subtract 10% from the rated dynamic and/or static lifting capacity (depending on the type of lift) of the crane at the lowest proposed angle or longest radius.
- The result is the "determining weight."
- If the weight of the load exceeds the "determining weight," the criterion has been met to call the lift "Heavy."

Note: Refer to *Appendix E – "Heavy Lift Worksheet."*

5.7 Personnel Transfer

- A personnel basket will be used for all offshore transfers between a facility and a boat whenever the crane is used to make the transfer.
- Hoists shall be equipped with a personnel handling certification tag. The hoist certifications are maintained in the crane file.
- Personnel certified hoists are maintained taking into consideration manufacturer's recommendations.
- Only properly designed workbaskets shall be used as work platforms or workstations.
- Personnel baskets are not designed for this purpose and shall not be used as such.
- Crane hooks used to lift personnel baskets will have a positive locking device equipped with a locking pin.
- Spring loaded latches and self-latching mechanisms must also be closed and secured with a locking pin.
- All shackles incorporated in a Personnel Basket lifting configuration will be tight, and wire locked.
- The crane operator, while transferring personnel between vessels or from a vessel to a platform, should raise the personnel basket only high enough off the deck to clear all obstructions.
- Personnel lifts to and from a motor vessel shall be swung over water and not directly over the vessel whenever possible.
- All personnel being transferred over water must wear an approved Personal Floatation Device (PFD) (Type 1 or Type 5) that is properly donned.
- The number of personnel and/or weight allowed to ride on the personnel basket shall not exceed the manufacturer's rated capacity.
- Personnel riding on the personnel basket shall ride on the outside of the basket, facing inward, with their arms locked around the netting.
- Personnel baskets will be equipped with tag lines free of knots and must be a minimum of 15 feet in length.

- Cargo other than personal hand luggage and small supplies and equipment will not be transferred with the personnel basket. Cargo must not overhang the edge of the personnel basket.
- All personnel baskets will have a safety "shock" load strap.
- Cranes shall not be used to raise or lower personnel into or out of tanks or other production vessels.
- Only properly designed personnel hoisting equipment shall be used for this purpose.
- Personnel shall not be allowed to ride on the following:
    - Any load,
    - Slings,
    - Cables,
    - Headache ball (connected to the whip line or fast line), or
    - The load blocks.
- Only qualified "A" or "B" crane operators are allowed to transfer personnel.
- All other crane operators ("C" crane operators and maintenance personnel), whether Robinson Brothers Construction, Inc. or contractor, are prohibited from transferring personnel.
- All personnel lifts shall be under power control both up and down.

5.8 Rigging Practices

- Personnel performing "Rigger" functions or activities shall meet the requirements of Section 9.0 (API RP 2D trained).
- Sling angles will not be less than 30 degrees from the horizontal (or not more than 60 degrees from the vertical). See *Appendix C-2a* for proper sling angle calculations.
- **NO** "field fabricated" slings shall be used
- Knots or kinks are not permitted in wire rope or slings for any reason.
- Slings and wire rope must not be used if they have no certification tag and any excessive amount of wear, damage, flat spots, broken wires, or visual lack of lubrication exist.
- All slings must be certified and tagged.
- If any of the above conditions are present, the equipment will be replaced or sent in for inspection, testing, and refurbishment by qualified personnel.
- All slings that will be permanently placed out of service shall be destroyed and properly disposed of, and slings that will be placed out of service temporarily (i.e. recertification process) will be properly tagged “Out of Service.”
- Chains, fiber rope, or "soft line" shall not be used in the place of wire rope slings to lift loads or personnel.
- Appropriately rated, certified nylon or synthetic webbed slings are acceptable for non-personnel lifts.
- Wire rope and slings shall not contact any rough-cut edges or holes such as pad eyes and shall be padded or properly protected to prevent damage from contact with sharp corners.
- Shackles must be used with all pad eyes.

- Hook openings shall be turned outward on hook slings. (*see Appendix C-2*)

a. Tag Lines

- Tag lines shall be used on all lifts. They shall be of sufficient length, diameter, and strength to allow adequate control of the load by the rigger(s).
- The free end of tag lines should not contain anything that is likely to become snagged during lifting operations (e.g., knots or weights).
- Taglines should be connected to the lowest practical point and at right angles on the load whenever possible.
- If a tagline cannot be attached directly to the load, it must be attached to the shackle end of the sling as near the load as possible.
- Slings and tag lines must be clear of all obstructions before the signal person and/or rigger divert their attention from the load.
- At no time are load hooks or lines to be used/lowered underwater.
- If underwater operations are to be performed, the contractor shall furnish the proper submersible cable/equipment.

b. Shackle Information:

- There are two types of shackles commonly used in rigging. They are the anchor (bow type) shackle and chain ("D" type) shackle. The pin styles commonly used with shackles are screw pins, bolt pins, and loose pins. Shackles, like most other rigging hardware, are sized by the diameter of the steel in the bow section rather than the pin size.
- Screw pin shackles are to be used when lifting and placing a load. The pin shall be tightened prior to each lift. This type of shackle shall be the preferred method when it will be a temporary connection. Precautions should be made to keep the screw pin tight during lifts. The screw pin shackle is capable of being used at full working loads to gather multiple-leg slings.
- Bolt type shackles are to be used in permanent or long-term installations. The proper nut and cotter pin shall be used at all times with this type of shackle. The bolt pin shackle is capable of being used at full working loads to gather multiple-leg slings. It can also be side-loaded at a reduced working load limit.
- **ONLY** stainless and/or forged alloy shackles shall be used. All shackles must have their crown size, manufacturer and rated capacity clearly embossed. (*See Appendix C-4 through C-5*)
- **ONLY** properly fitted screw pins shall be used in shackles. Never replace the shackle pin with a bolt.
- Shackles should never be used if the distance between the eyes is greater than listed in (*Appendix C-4 through C-5*.)
- All screw pins must be straight and completely seated in the shackle.
- Shackles worn in the crown or the pin by more than 10% of the original diameter shall be discarded.
- Shackles should never be attached where the load could roll or unscrew the pin during the lifting process.

- Shackle Specifications: *(see Appendix C-5)*

5.9 Overhead/Portable Hoist Operating Practices, Procedures, and Requirements

5.10 Hoisting Equipment

This section applies to all overhead/portable hoists including those operated by hand, by electricity, or by pneumatics. All operations, including maintenance operations, shall be performed in a safe manner. At a minimum, this shall include the following:

- The hoist operator shall inspect the immediate area, hoist, associated rigging, and the load prior to making a lift.
- Deficiencies that could jeopardize the lift shall be corrected prior to making the lift.
- No part of the hoisting system shall be overloaded. This includes the beam upon which the hoist rides, the hoist itself, the lifting chain and hook, and any slings or shackles associated with the lift. The support beams should be marked with the load limitation.
- All personnel must be clear of the load before it is lifted.
- Lifts may not travel over personnel.
- Upon lifting, the load hook shall be positioned directly over the load prior to making the lift.
- The hook must have a properly functioning safety latch.
- A minimum distance of 20 feet is required when working around higher voltage power lines and conductors.
- Proper personal protective equipment (PPE) must be worn during all hoisting operations.

5.11 Drum and Bottle Racks

Drum and Bottle Racks used for transporting drums and pressure cylinders offshore will be designed to appropriately secure and safely transport drums and cylinders. Refer to Appendix G and H for design guidelines.

5.12 Boats, Shore bases, and Load Rigging/Marking

- Dock personnel will examine cargo and refuse to attach or lift any load they judge to be unsafe.
- It is a recommended practice that load/equipment delivered to shore-base for shipment offshore be pre-rigged with certified slings/ rigging equipment and configured with a one- point hook up.
- The one point hook up should be long enough so that a rigger can attach the load to the crane from the deck or ground level.
- All skid-mounted equipment (e.g., welding machines, air compressors, pumps) that exceeds 1,000 lbs. capacity shall be permanently marked with the maximum weight of the equipment.
- All cargo containers, such as trash baskets, tool baskets, grocery boxes, drum racks, gas cylinder racks, cutting boxes, sensitive material bins, hazardous material bins.
- Also, Multi-Purpose Tanks (MPT) tanks, cutting boxes, tote tanks, and portable racks must be permanently marked with the design "gross" weight capacity and "net" (empty) weight.
- Pallets shall not be used to transport loose material or equipment to or from offshore facilities. Palletized materials should be placed in approved cargo containers prior to handling with the crane.

- For drilling/wells work operations, certain palletized materials that are properly secured (i.e. sack materials) may be transported with appropriate pallet lifting devices.
- Robinson Brothers Construction, Inc. Cargo manifests shall be completed prior to transporting loads to and from offshore and shall include the weight of each piece of cargo.
- Cargo manifests, showing both the loads and their weights (if over 5,000 pounds), shall be faxed from the shore base to the affected offshore facility and communicated to the crane operator so that he/she may prepare for the lift(s).
- Boat personnel shall maintain radio communication with the crane operator on the platform at all times while lifts are being made to or from the boat.
- Boat personnel should direct the placement of each load onto the deck of the boat, taking into consideration balance, actual and anticipated sea conditions, and subsequent load changes.
- However, the load placement location must not cause the crane operator to exceed the safe working limits of the crane (e.g., exceed safe boom angle).
- The crane operator shall plan the lifts with the boat crew and refer to the cargo manifest prior to making the first lift.
- Loads in excess of 5,000 pounds shall be clearly marked on both the load and the cargo manifest before placing the load on the boat. The below color and shape marking labels shall be used. Where possible, the markings should be visible from the crane.

Green	Less than or equal to 5,000 lbs	Square
Yellow	5,001 lbs to 10,000 lbs	Octagon
Red	Greater than 10,000 lbs	Octagon

  - ❖ Boat lifts shall be made over the water whenever possible.
  - ❖ Loads coming from boats shall be raised only high enough to clear the sides (gunwales) of the boat before swinging the load over the water.
  - ❖ Loads made to a boat shall be lowered over the water until just before swinging the load over the gunwales.

5.12.1 Air Tuggers/Hoist/Winch

- Only those personnel who are trained in the safe operation of this equipment shall be allowed to conduct the operations of this equipment.
- Operators of this equipment shall have good hearing, vision and depth perception. This is to be documented by the company and all contract company.
- Prior to using this equipment, a visual inspection shall be conducted, by the operator, to ensure there are no signs of wear and/or other damages.
- Keep hands, clothing, etc., clear of moving parts.
- Never place your hand in the throat area of a hook or near wire rope which may be spooling onto or off of the winch drum.
- This equipment is not approved to be used for lifting, supporting, or transporting personnel.
- Loads shall not be lifted or supported over personnel.

- The supporting structures and load-attaching, or lifting, devices used with this equipment shall provide adequate safety factors to handle the rated load, plus the weight of the equipment.
- During lifting operations ensure that the load's path is clear of obstructions.
- No load shall be left unattended.
- All loads shall contain a tag line of proper length.
- The operator should have continuous eye contact with the load during the entire lift.
- If this cannot be accomplished, a signal person shall assist the operator to ensure a safe lift is executed. (**NOTE:** Signals need to be discussed during the pre-job meeting.)
- Do not jerk, swing or side-pull the load.
- Prior to leaving the area the operator shall bleed off the air supply and ensure that all emergency stop controls are in place.
- The equipment shall be operated in a slow controlled manner.
- During operations, the drum shall have at least three tight wraps of wire rope on it at all times.
- During operations, do not allow the wire rope to spool incorrectly.
- Always use proper PPE when handling wire rope. (Example: Leather gloves)
- Always use approved, certified rigging equipment.
- Anyone who attaches or detaches lifting equipment to loads or lifting devices shall be trained in accordance with API RP 2 D.
- Do not attach a welding electrode to the equipment or the wire rope.
- Never run the wire rope over a sharp object.
- Do not use wire rope as a ground for welding.

a. Installation:

- Prior to installation, inspect the equipment for damages.
- Do not weld to the base or any part of the equipment.
- Proper mounting brackets shall be securely attached to the equipment. Which will then allow the assembly to be welding to the deck.
- The mounting surface shall be level and of sufficient strength to handle the rated load plus the weight of the equipment.
- Ensure the manufacturer instructions/procedures (operator's manual) is followed.

5.13 Inspection and Maintenance

5.13.1 Equipment Inspection

Equipment must be inspected monthly by a competent person. The inspection must be documented. Documentation must include the following:

- Items checked,
- Results of the inspection, and

- Name and signature of the inspector.

5.13.2 Operational Inspections and Maintenance

a. The inspection shall be:

- Performed prior to starting the crane for the first use of the day.
- Prior to or during each change in operator, and as the qualified operator deems it necessary.
- Also, during the day for extended operations or changes to JSA,
- Corrections or repairs will be made before starting the crane, and the inspection must be documented on the Robinson Brothers Construction, Inc. *Offshore Crane Pre-Use Inspection Form*. (See Appendix F)

b. Pre-Use Inspection including the following items will be completed:

- Check the load chart for legibility and accuracy.
- *Load Charts* should be made of rigid material and weather durable for offshore conditions and must be affixed in clear view of the crane operator.
- Check the boom angle indicator.
- Check fuel level and fill if needed.
- Check engine oil level and fill if needed.
- Check hydraulic fluid levels and fill if needed.
- Move all controls to ensure freedom of movement/operations.
- Test horn, radio, and any other communication equipment (e.g., Getronics) for proper operation.
- Check emergency shutdown device(s) for proper position.
- Visually inspect boom, boom components, and boom appendages for damage.

5.13.3 Prior to Making the First Lift,

Each crane operator shall inspect the crane for the following items (corrections or repairs should be made prior to making the first lift):

- If the crane is mechanical, check protection sheet metal covers over boom hoists, operating clutches, and brakes to ensure that they are closed/shut and secured. All personnel lifts with a mechanical crane are to be made under power control both up and down.
- Boom up and down to verify proper boom hoist operation and function of boom angle indicator.
- Verify that load line or fast line hook safety latches are in good working order.
- Verify proper function of swing capability.
- Verify that both auxiliary and main hoist hooks swivel properly on the block to prevent the cable from twisting.
- Inspect rigging equipment that will be used for impending lifts to verify condition and the presence of tags where appropriate.

- Consult cargo manifest to identify the weight of the load.

5.14 Mechanical (Preventive) Inspections and Maintenance

- Cranes will be kept clean and properly maintained.
- All cranes will be inspected Monthly by a qualified (Class A or B) crane operator regardless of usage category.
- The crane will be started, boomed up and down, swung 360°, hoists operated, and safety devices tested. This task performance will help keep critical components from sticking and/or freezing up.
- All Monthly inspections will be documented on the Robinson Brothers Construction, Inc. Monthly Crane Inspection form.
- All deficiencies noted shall be repaired immediately.
- Maintenance procedures are spelled out clearly for each inspection interval within the inspection guidelines.
- The operator, mechanic, and inspector are each responsible for certain tasks. Each person will carry out his or her duties as prescribed.
- Manufacturer instructions/procedures (operator's manual) shall be followed when performing maintenance.

  Running wire ropes will be changed every three years or sooner depending upon condition indicated by inspection.

  Pendant lines will be changed every eight years or sooner depending upon condition indicated by inspection.

  Slings (Wire and Synthetic/Nylon) will be replaced every five years or sooner depending upon condition indicated by inspection.
- Slings should be stored in areas where they will not be exposed to excessive amounts of water, extreme heat, or corrosive fumes, liquids/sprays. Slings should not be stored on the deck. All slings, when not in use, should be kept on a rack and secured properly to prevent abrasion due to rubbing and maintained in a manner to minimize corrosion. Synthetic or Nylon type slings should also be stored out of direct sunlight and away from excessive heat and chemicals.
- Wire rope shall be provided by manufacturers with certified ISO 9001 quality management system. Certificates of conformity shall be provided with each spool of wire rope. Stainless steel tags of conformity shall be removed from shipping spool and placed on the winch in which the wire rope is installed. Each time the wire rope is installed a new tag will be installed.
- Repairs will be done by qualified individuals and recorded in the crane maintenance file.

Robinson Brothers Construction, Inc. contract field mechanics may perform certain maintenance tasks on a crane. The extent of which the maintenance will be performed will be dictated by the mechanics' experience, training, and familiarity with the machine. Examples of such maintenance are:

- Engine Preventive Maintenance and Repair
- Lubrication of components

5.15 Required Inspections

Inspections will occur according to usage hours based on a three-month average with the exception of

Monthly inspections which will be conducted on all cranes regardless of usage category. *(API RP-2D – 4.1.1)* Usage hours are defined as actual operating hours or "stick time." Usage hours do not include engine idle time.

The usage ratings, rating hours and required inspections are as follows: (based on 3-month average)

Category	Usage	Inspection Type
Infrequent	10 hours or less	Pre-Use, Monthly Annual
Moderate	50 hours or less	Pre-Use, Monthly Quarterly, Annual
Heavy	50 or more hours	Pre-Use, Monthly, Quarterly and Annual

In addition to the requirements of API RP 2D, all cranes, regardless of usage level, will be given **Pre- Use and Monthly** inspections by the qualified crane operator or competent person. Pre-Use inspections will be performed before daily usage and more frequently if the crane is used on a continuous basis or if deemed necessary by the qualified operator. "Daily" means a 24-hour period beginning at 12:00 a.m. of one day and ending at 12:01 a.m. the next day. Pre-Use inspections will also be performed at each operator shift change. Class C Crane Operators may not perform any crane inspections (pre -use, monthly, etc.) unless under the direct supervision of a Class A or B Crane Operator.

- Pre-use inspections will be documented on the Robinson Brothers Construction, Inc. Crane Pre-Use Inspection Form.
- Monthly inspections will be performed by a qualified crane operator (Class A or B) once per Calendar Month and must be documented.
- Special attention will be given to "noted" discrepancies with communication to the Foreman and/or Mechanic on duty upon discovery. The *Pre-Use Inspection* will also be recorded (operating hours, actual usage but not engine idle time).
- Inspectors for Initial, Annual, and Quarterly inspections will be provided by a Third-Party Crane Service Company, and the Inspector/Mechanic must be "Qualified" as stated in API RP-2D 2.2. **"Qualified" Crane Operators will perform "Pre-Use" and "Monthly" inspections.**
- Inspectors will complete the Robinson Brothers Construction, Inc. crane inspection forms in addition to their companies' inspection forms. A Robinson Brothers Construction, Inc. or Contract Supervisor's signature must be on all inspection forms.
- This signature denotes acceptance of the inspection, forms are filled out correctly and assure discrepancies are being resolved (parts are on order).

5.15.1 Deficiencies

- Upon inspection, minor deficiencies will be recorded and repaired on the spot or within a short time period of (2 weeks).

5.16 Placing Crane Out of Service

A Crane will be tagged "Out of Service" at the operator controls and rendered inoperable if a major deficiency cannot be corrected immediately. Refer to Robinson Brothers Construction, Inc.'s Tagout Procedures if necessary to assure crane is properly placed out of service and rendered inoperable. A crane may be rendered inoperable by disabling the start system. Notify Robinson Brothers Construction, Inc. Foreman immediately if a crane is tagged "Out of Service" or is de-rated upon inspection.

If a crane is de-rated a new "temporary" Load Chart must be obtained from a certified engineer and posted in the cab, and a record of it kept on file. There must also be a sign posted at the operator's station stating, "This Crane is De-Rated %" during the period of this status.

To place either the auxiliary or main winch out of service and still allow the crane to continue operating, the following procedures shall be followed.

1. The control lever linkage must be physically detached between the control lever and the control valve.
2. Both hydraulic hoses at the winch motor must be removed, and caps must be placed on the motor connections and plugs must be installed on the ends of each hose.
3. Robinson Brothers Construction, Inc.'s Tagout procedure must be followed.

If all of the above items cannot be done properly and simultaneously, the entire crane must be placed out of service until repairs are made. If there are any questions regarding these procedures, the Robinson Brothers Construction, Inc. Crane Maintenance Foreman must be notified.

5.16.1 Hoist Inspection and Maintenance

- The load chain and hook shall be inspected daily or prior to each use if used infrequently.
- The inspection should identify problems that could adversely affect the lifting operation.
- The hoist brake should be checked at the start of each lift by hoisting the load a few inches and watching to see if the brake holds. If the load does not drift downward, the lift may be continued. If the load does drift downward, the brake must be repaired before continuing the lifting operation.
- All parts of the pneumatic system should be checked for leakage prior to making the lift.
- The lifting controls should be checked for smooth and proper operation. This applies to the hand chain on manually operated hoists as well as the controls on electrically or pneumatically operated hoists.

6.0 RECORDKEEPING

Records of inspections, maintenance, load tests, pull tests, operational tests and sling and cable certifications will be kept in a single file folder on the platform where the crane resides, for four years *(API RP 2D 4.2.2)*. Current Pre-Use inspections can be kept on/in the crane or about the crane (out of the weather) or in the platform office. *(API RP 2D 3.1.3.k.1.o).* Aged pre-use inspections will be kept in the crane file.

- Work Orders will be initiated for any and all work performed.
- A list of current *Qualified Crane Operators* will be kept.
- A sling inventory will be performed once a month verifying tags or other identification on the slings, and, that related certification documents are filed on location.
- A running rope record and associated certification documents will be kept for each crane in its respective crane file.
- Documentation must be retained for 3 months.
- (Documented monthly inspection not required if the daily inspection is documented and records are retained for 3 months).

7.0 REFERENCES

1.	**Documents & External References** American Petroleum Institute (API) Recommended Practices in the (RP) 2D (regulatory incorporated), API RP 2D (latest edition), http://www.cranemaster.no/support/overview-of-standards, https://ehs.princeton.edu/sites/ehs/files/media_files/Hand_Signals_Cranes.pdf, http://www.nccer.org/load-charts, https://www.law.cornell.edu/cfr/text/30/250.107, https://semsportal.apachecorp.com/Public/Safety%20Alert%20Updates/Apache%20Heavy-Identified%20Lift%20Procedures.pdf,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

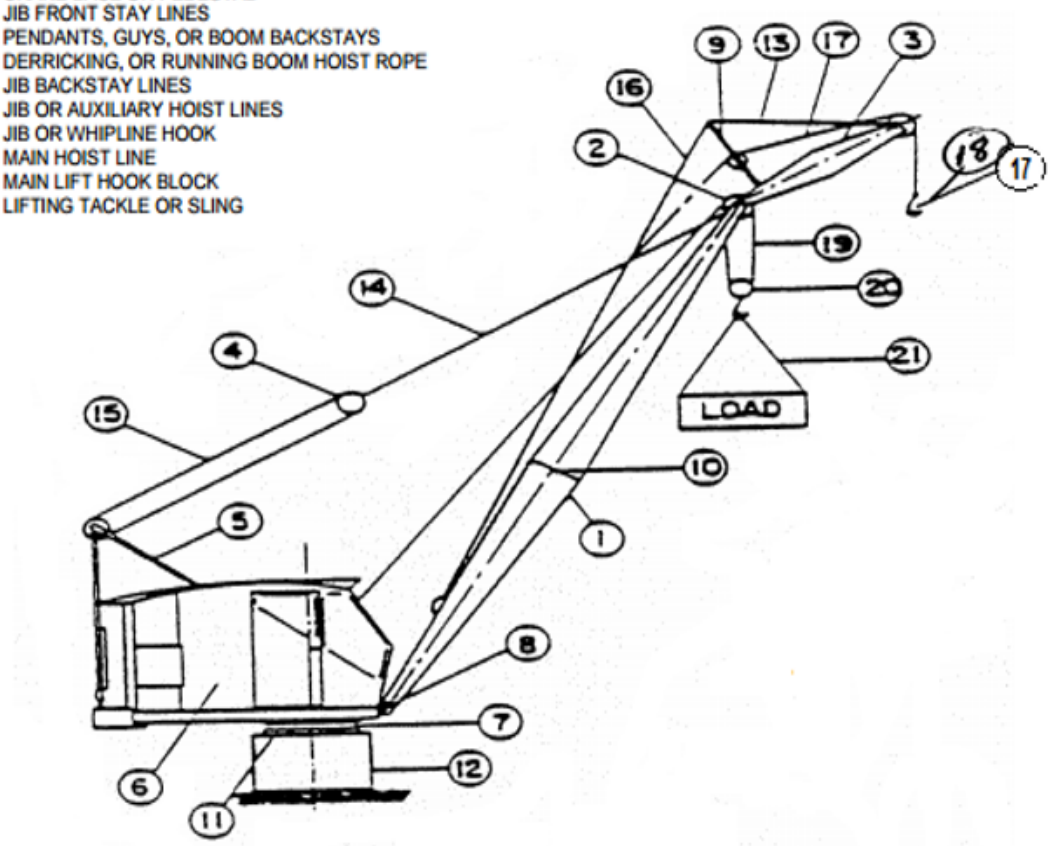
9.0 APPENDICES

Appendix A: Crane Terminology

CRANE TERMINOLOGY			
Boom head Sheave Assembly	Swing Circle or Roller Path	Crane Base or Pedestal	Jib or Auxiliary Hoist Lines
Jib	Boom Foot Pin	Jib Front Stay Lines	Jib or Whip-line Hook
Floating Harness or Bridle	Jib Mast	Pendants, Guys, Or Boom Backstays	Main Hoist Line
Gantry Or A-Frame	Boom Splice Bolts, Or Connectors (Typical)	Derricking, Or Running Boom Hoist Rope	Main Lift Hook Block
Revolving Superstructure	Foundation Bolts or Fastenings	Jib Backstay Lines	Lifting Tackle, Or Sling

Appendix C: Crane Assembly

1 CRANE BOOM
2 BOOMHEAD SHEAVE ASSEMBLY
3 JIB
4 FLOATING HARNESS OR BRIDLE
5 GANTRY OR A-FRAME
6 REVOLVING SUPERSTRUCTURE
7 SWING CIRCLE OR ROLLER PATH
8 BOOM FOOT PIN
9 JIB MAST
10 BOOM SPLICE BOLTS OR CONNECTORS (TYPICAL)
11 FOUNDATION BOLTS OR FASTENINGS
12 CRANE BASE OR PEDESTAL
13 JIB FRONT STAY LINES
14 PENDANTS, GUYS, OR BOOM BACKSTAYS
15 DERRICKING, OR RUNNING BOOM HOIST ROPE
16 JIB BACKSTAY LINES
17 JIB OR AUXILIARY HOIST LINES
18 JIB OR WHIPLINE HOOK
19 MAIN HOIST LINE
20 MAIN LIFT HOOK BLOCK
21 LIFTING TACKLE OR SLING



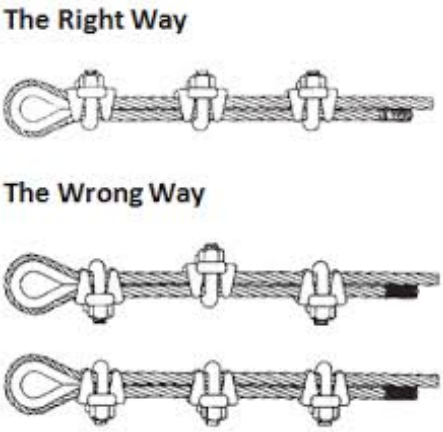
Appendix C-1: Rigging Specifications & Information

Incorrect–Cutting action of eye splice on running line.

Correct–Use thimbles in the eyes.

Incorrect–Shackle pin bearing on running line can work loose.

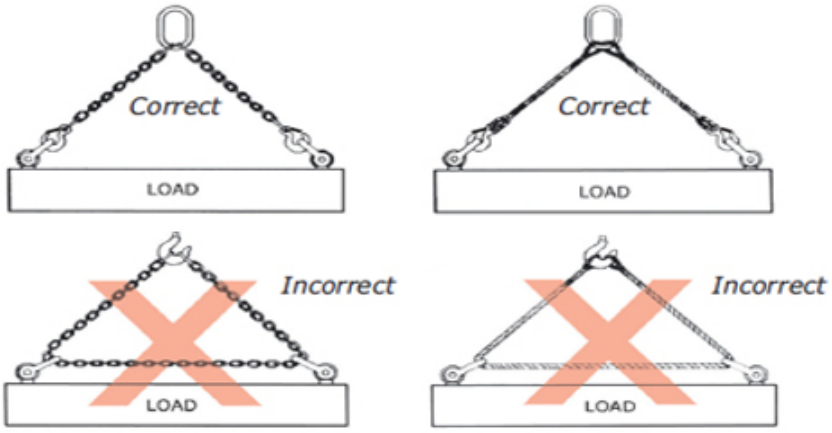
Correct–Shackle pin cannot turn.



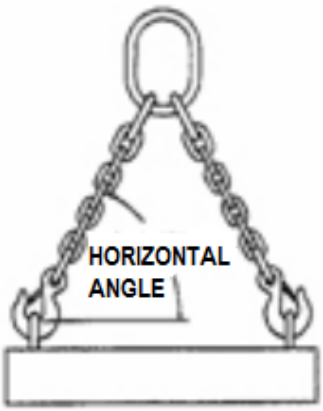
Number and Spacing of U-Bolt Wire Rope Clips

Improved plow steel, rope diameter (inches)	Number of clips		Minimum spacing (inches)
	Drop forged	Other material	
1/2 (1.27 cm)	3	4	3 (7.62 cm)
5/8 (.625 cm)	3	4	3-3/4 (8.37 cm)
3/4 (.75 cm)	4	5	4-1/2 (11.43 cm)
7/8 (.875 cm)	4	5	5-1/4 (12.95 cm)
1 (2.54 cm)	5	6	6 (15.24 cm)
1-1/8 (2.665 cm)	6	6	6-3/4 (15.99 cm)
1-1/4 (2.79 cm)	6	7	7-1/2 (19.05 cm)
1-3/8 (2.915 cm)	7	7	8-1/4 (20.57 cm)

Appendix C-2: Pairing Sling Legs with Eye Bolts



Correct and incorrect methods of pairing sling legs with eye bolts



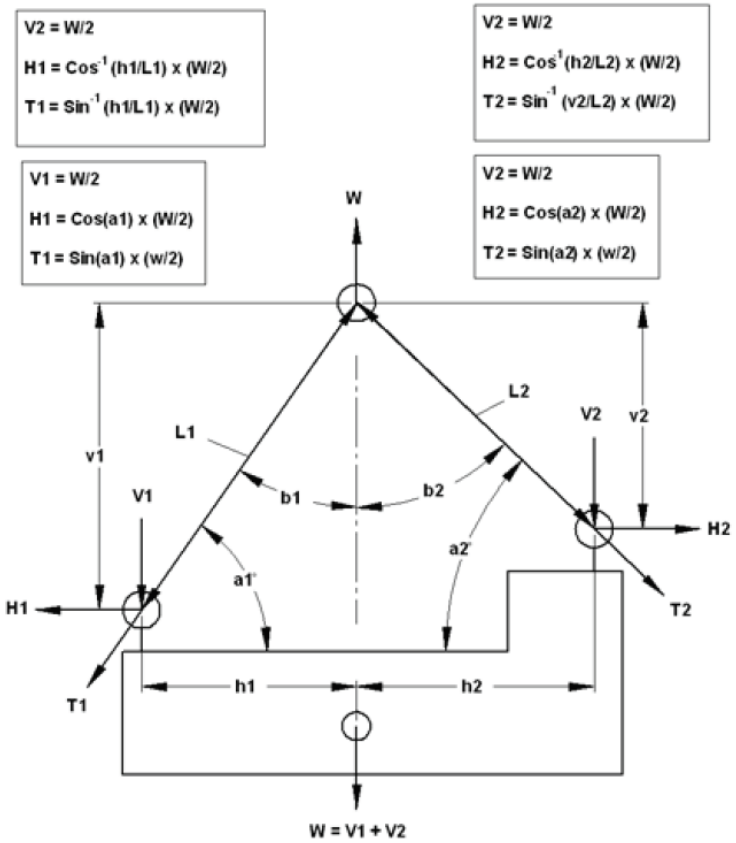
The Correct Way

Appendix C-2a: Sling Lifting Load Calculations

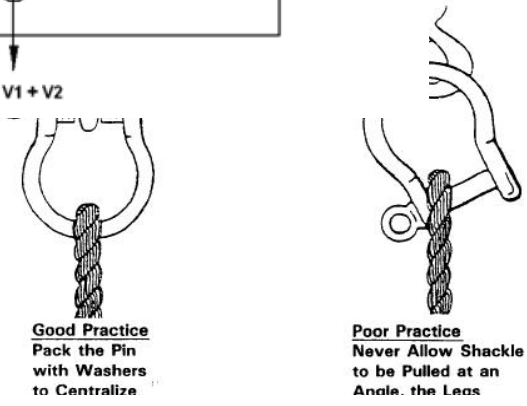
Application of Slings for lifting considerations and sling lifting load calculations.

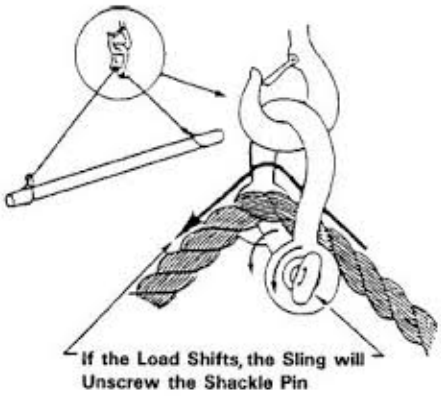
Slings should have a minimum design factor appropriate to the type of material as specified in the appropriate section. Features that affect the rated capacity of the sling and that shall be considered in calculating the design factor are:

- Nominal breaking strength of the material from which it is constructed.
- Splicing or end attachment.
- A number of parts in the sling.
- Type of hitch (e.g., straight pull, choker hitch, or basket hitch).
- The angle of loading and load center of gravity.
- The Diameter of curvature around which the sling is bent.
  - The center of gravity of an object is a point around which the entire weight may be concentrated. To make a level lift, the crane hook or point of suspension must be directly above this point. While slight variations are usually permissible, if the crane hook is too far to one side of the center of gravity, dangerous tilting will result and should be corrected at once. For this reason, when the center of gravity is closer to one point of the sling attachment than to the other, the slings must be of unequal length. Sling stresses and sling angles will also be unequal.
  - Rigging shall be configured such that slings do not reeve or slip through the hook. To attach the load, locate the center of gravity, position the crane hook directly above the center of gravity, and then rig the load so that it will lift level and true.



Appendix C-3: Shackle Loads





Appendix C-4: Shackle Pre-Use Inspection Checklist

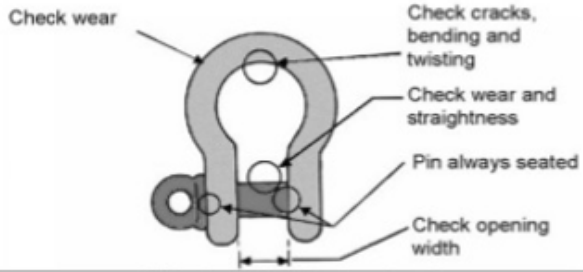
Shackle Pre-Use Inspection Checklist

Inspect shackles daily before use and frequently during use.

- Each shackle body shall have forged, cast, or die stamped markings by the manufacture showing: name or trademark of the manufacturer, rated load/capacity (WLL or SWL), and size. This information shall not be missing and must be legible.

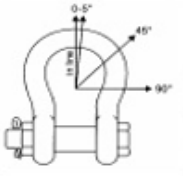
Remove from service when any of the following conditions exist:

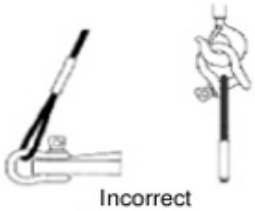
- Indications of heat damage including weld spatter or arc strikes
- Excessive pitting or corrosion
- 10% reduction of the original or catalog dimension at any point around the body or pin
- Body spread including: bent, twisted, distorted, stretched, elongated, cracked, or broken load-bearing components
- Excessive nicks or gouges
- Incomplete pin engagement, shoulder of pin is not flush with shackle body
- Excessive thread damage
- Evidence of unauthorized welding



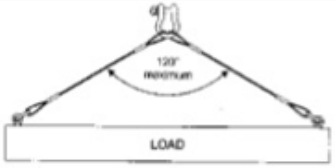
Never Replace a Shackle Pin with a Bolt

The Load will Bend the Bolt

Side Loading Reduction Factors Screw Pin and Bolt Type Shackles		
	Angle of Side Load from Vertical In-Line of Shackle	Percent Rated Load Reduction
	0° - 5°	0%
	5° - 45°	30%
	46° - 90°	50%
	Over 90°	Avoid



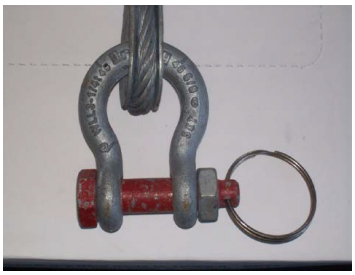
Incorrect Applications



The rated capacity of shackles only applies when they are symmetrically loaded and the included angle between two sling legs is a maximum of 120°. Shackle capacity must be reduced when the angle is greater than 120°.

Appendix C-5: Preferred Shackles

Preferred Shackles



Screw Pin "Anchor Style Shackle"- These shackles are to be used when lifting and placing a load. The pin shall be tightened prior to each lift. This type of shackle shall be the preferred method when it is a temporary connection.

The screw pin shackle is capable of being used at full working loads to gather multiple-leg slings. It can also be side-loaded at a reduced working load limit.

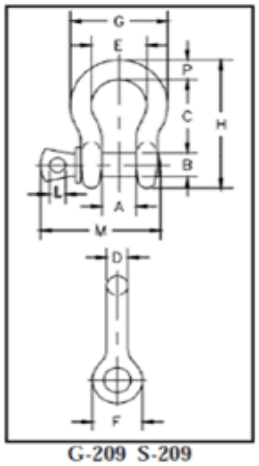
Bolt Type "Anchor Style Shackle."

These shackles are to be used in permanent or long-term installations. The proper nut and a cotter pin or stainless steel keeper rings shall be used at all times with this type of shackle. The bolt pin shackle is capable of being used at full working loads to gather multiple-leg slings. It can also be side-loaded at a reduced working load limit.

The Single Source for all your Lifting, Design & Fabrication Requirements

Products

Product Name: Screw Pin Anchor Shackles
Product Number: G-209 S-209
Product Manufacturer: Crosby



G-209 S-209

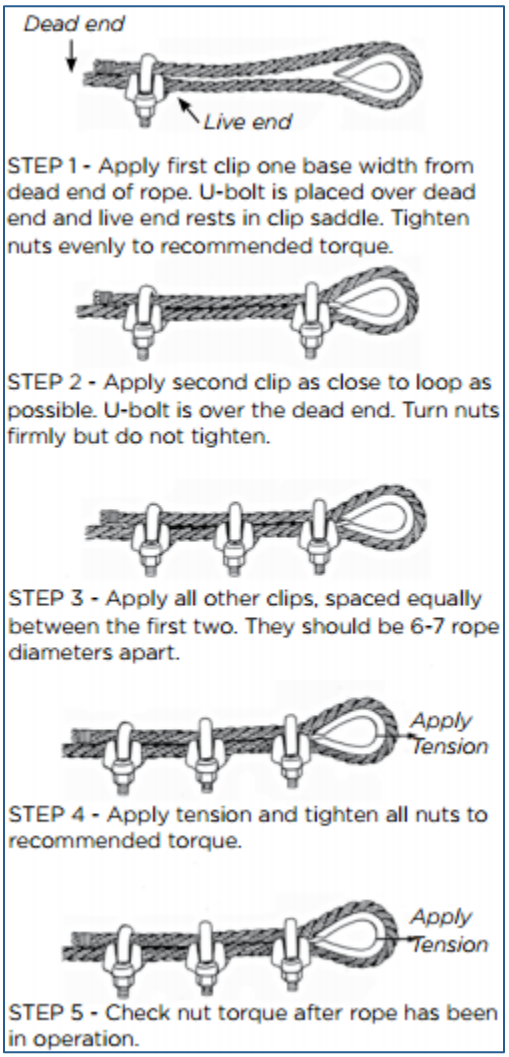
Nominal Size (in.)	Working Load Limit (t)*	Stock No.		Weight Each (lbs.)	Dimensions (in.)											Tolerance + / -	
		G-209	S-209		A	B	C	D	E	F	G	H	L	M	P	C	A
3/16	1/3	1018357	-	.06	.38	.25	.88	.19	.60	.56	.98	1.47	.16	1.14	.19	.06	.06
1/4	1/2	1018375	1018384	.10	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.43	.25	.06	.06
5/16	3/4	1018393	1018400	.19	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.71	.31	.06	.06
3/8	1	1018419	1018428	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.06
7/16	1-1/2	1018437	1018446	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.37	.44	.13	.06
1/2	2	1018455	1018464	.72	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	3-1/4	1018473	1018482	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	6-1/2	1018516	1018525	3.62	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	8-1/2	1018534	1018543	5.03	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.13	1.06	.25	.06
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.71	1.25	.25	.06
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.25	1.38	.25	.06
1-3/8	13-1/2	1018598	1018605	13.53	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.83	1.50	.25	.13
1-1/2	17	1018614	1018623	17.20	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10.00	.81	7.33	1.62	.25	.13
1-3/4	25	1018632	1018641	27.78	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	1.00	9.06	2.25	.25	.13
2	35	1018650	1018669	45.00	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	1.22	10.35	2.40	.25	.13
2-1/2	55	1018678	1018687	85.75	4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13.00	3.13	.25	.25

* **Note:** Maximum Proof Load is 2.0 times the Working Load Limit. Minimum Ultimate Strength is 6 times the Working Load Limit.

Appendix C-6: Installing Cable Clips Correctly

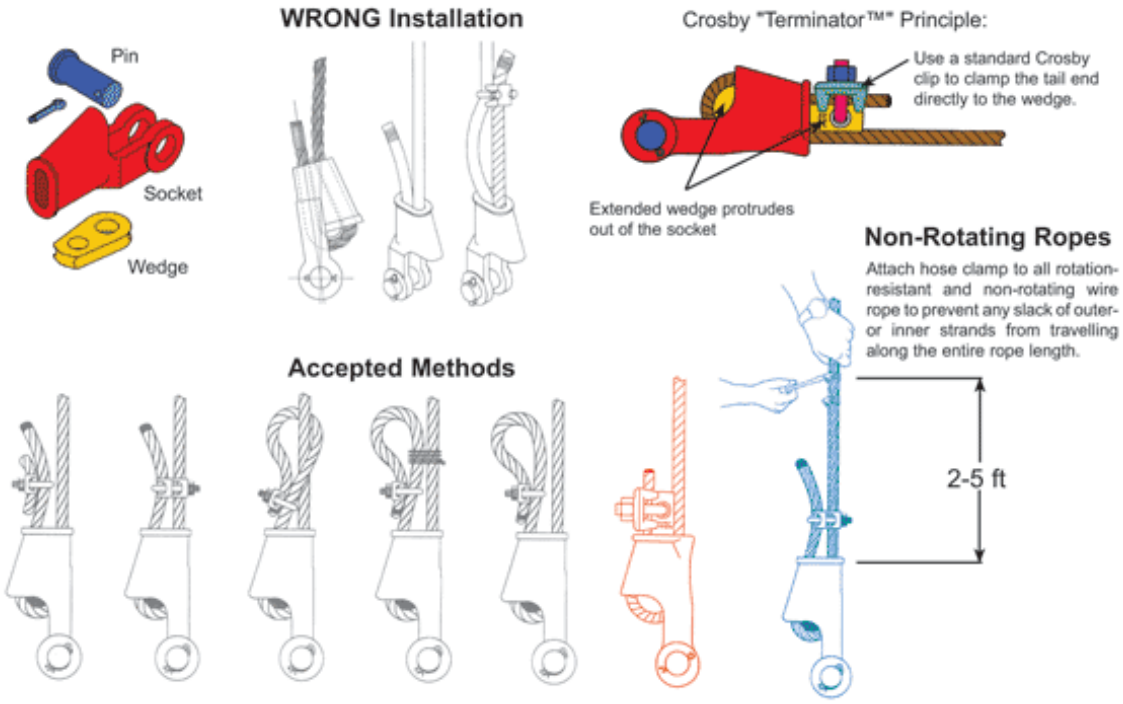
- Most cable clips have two sections. There's a saddle part and a U-shaped part. You need the right-sized clip for the wire rope diameter.
- You need to know the number of clips required, the amount of rope to turn back from
- the thimble, and the torque needed to tighten the nuts. There are tables that spell out all of this information. (See sample below.)
- At least three clips should be used when making any prepared loop or thimble-eye termination for wire rope, especially for hoisting.
- All three clips must be installed with the saddle part on the live end of the rope. This lets the live end rest in the saddle, so it is not crushed by the U part of the clip. A way to remember this is:
  - "Never saddle a dead horse."

The U goes on the dead end of the rope where crushing will not affect the breaking strength of the hoist line.

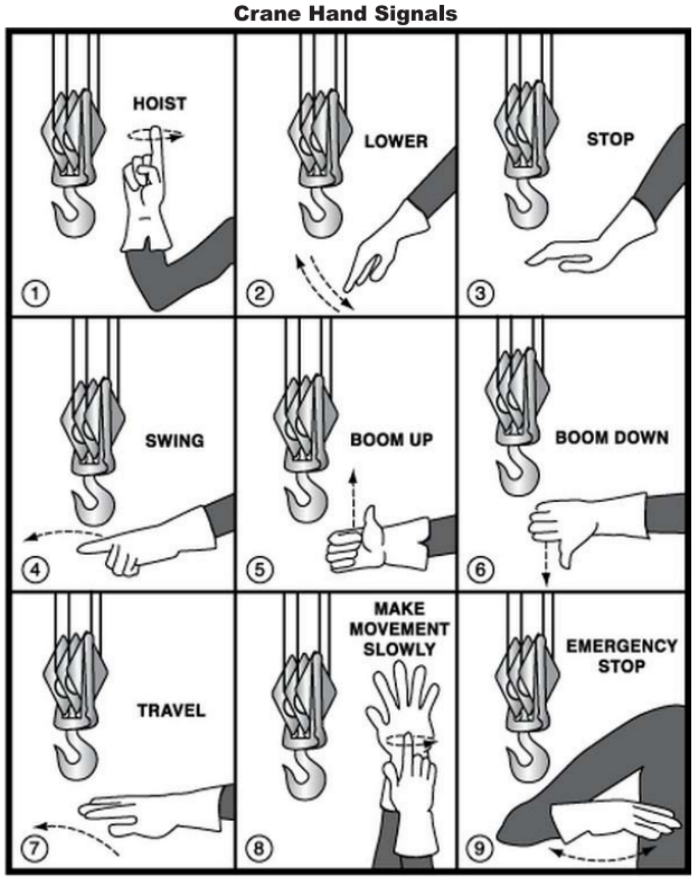


Rope Diameter (inches)	Minimum Number of Clips	Amount of Rope Turn-back from Thimble (inches)	Torque for Unlubricated Bolts (Foot-Pounds)
5/16	2	5 1/2	30
3/8	2	6 1/2	45
7/16	2	7	65
1/2	3	11 1/2	65
9/16	3	12	95
5/8	3	12	95
3/4	4	18	130
7/8	4	19	225

Appendix C-7: Securing Dead Ends of Wedge Socket Attachments



Appendix D: Hand Signal Chart



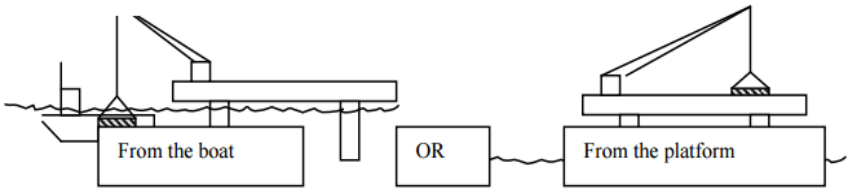
Appendix E: Heavy Lift Worksheet

Heavy Lift Worksheet

Identify the weight of the load to be lifted. _____ Lbs./Tons

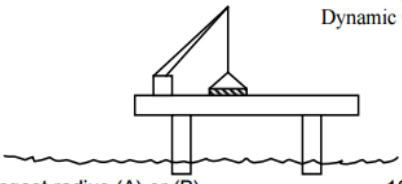
Using a platform deck drawing, identify the boom angle, load radius and dynamic capacity from the load chart at the proposed boat or platform location for the initial lift.

Boom Angle _____° Radius _____ ft.(A)
Dynamic Capacity at this angle _____



Using a platform deck drawing, identify the boom angle, load radius and dynamic capacity from the load chart at platform location to which the load is to be placed.

Boom Angle _____° Radius _____ ft.(B)
Dynamic Capacity at this angle _____



Dynamic capacity at longest radius (A) or (B) _____ - 10% = (C)_____

Weight of load _____
Weight of rigging _____
Weight of tackle _____
Total Weight _____

1. Total Weight _____
2. Adjusted Dynamic capacity (C)_____ (Determining weight)

If total weight (1) exceeds the adjusted dynamic capacity (2) the lift is "Heavy"

NOTE: The load radius is determined by measuring the distance from the center of the crane pedestal of the crane to the center of gravity of the load.

Appendix F: Pre-Use or Daily Walk Around Inspections and Services

	PRE-USE OR DAILY WALK AROUND INSPECTIONS AND SERVICES TO BE PERFORMED BY QUALIFIED OPERATOR	Okay ✓	Needs Attention ✓
1.	Check hourmeter (located in Machinery House) for proper operation. Record reading in space provided. Hourmeter reading:		
2.	Check overall condition of crane and support structure. Look for damage.		
3.	Check safety and instructional signs. Replace any that are illegible, deteriorated or missing		
4.	Visually check column, boom and swing components for cracked wilds and broken or missing bolts.		
5.	SLOWLY operate all powered components to their travel limits to check for proper limit switch operation		
6.	Check wire rope for attachment, damage, deterioration and proper lubrication.		
7.	Check all controls for proper operation.		
8.	Check load moment indicator for proper operations		
9.	Check personal warning horn for proper operation		
10.	Check all lighting for proper operation. (include helicopter warning light if applicable).		
11.	Check all brakes for proper stopping action.		
12.	Check hydraulic lines to brakes to brakes for damage and leaks (where applicable).		
13.	Check hydraulic brake unit high pressure filters service indicator (located in Machinery House) Service when required.		
14.	Check hydraulic brake power unit (located in Machinery House) breather filter service indicator. Service when required.		
15.	Check all drive motors for proper operation.		
16.	Check swing gearbox and drivers for overheating and leaks		
17.	Check hook and block for proper attachment and condition of safety latch.		
18.	Check all sheave pins and retainers.		
19.	Check Machinery House ventilation system		
20.	Check fire extinguisher for proper charge, seal, and certification interval.		
21.	Check the swing gear lubricant for shavings.		
22.	Check for proper CW and CCW rotation and REPORT any unusual noises and vibrations		
23.	Check load rating chart at operator's controls. It must be correct and visible.		
24.	Check hoist driver for visible oil leaks.		
25.	Visibly check loose gear to be used, such as sling hooks and shackles.		
26.	Lubricate components and correct deficiencies as required based on these inspections.		

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The Robinson Brothers Construction, Inc. *Disciplinary Action Program and Policy Procedures* are designed to provide constructive and corrective action any time possible. It has been designed consistent with our organizational values, HR best practices, and employment laws.

1.1 Scope

The content described in this document encompasses the steps of a *Disciplinary Action Program and Policy Procedures*. Robinson Brothers Construction, Inc. reserves the right to combine or skip steps depending upon facts of each situation and the nature of the offense. The level of disciplinary intervention may also vary.

1.2 Policy Statement

Employees need to know Robinson Brothers Construction, Inc.'s position on safety and health, and what the Robinson Brothers Construction, Inc. expects of them. They need a clear understanding of the rules and the consequences of breaking those rules. Some of the factors that will be considered depend upon whether the offense is repeated despite coaching, counseling and/or training, the employee's work record and the impact the conduct and performance issues have on the company.

2.0 DEFINITIONS

No definitions are specific to this document.

2.1 Responsibilities

2.1.1 Role of Disciplinary Systems in the Workplace

The disciplinary system does not exist primarily to punish employees. Its purpose should be to control the work environment so that workers are protected, and accidents are prevented. A disciplinary system helps ensure workplace safety and health by letting the company employees know what is expected of them. It provides workers with opportunities to correct their behavior before an accident happens.

2.1.2 Manager and Human Resources

The companies Managers and Human Resources are responsible for enforcing the *Disciplinary Action Program and Policies.*

2.1.3 Supervisor

- Know, communicate, and enforce the *Disciplinary Action Program and Policies*
- Observe employees working

- Analyze & discuss safety hazards
- Communicate with your employees
- Follow up with your employees
- Ensure all employees are train on rules and procedures
- Conduct inspections
- Acknowledge safety behavior
- Investigate and report accidents
- Correct unsafe and hazardous conditions

It is strongly recommended, that no disciplinary action be taken before investigating the situation and involving Human Resources as appropriate.

2.1.4 Employee

Employees who have been subjected to disciplinary action have the right to appeal the action through the pertinent grievance procedure.

3.0 SAFETY

3.1 Workplace Audits and Inspections

Inspection of work areas and audits of safety programs are tools that can be used to identify problems and hazards before these conditions result in accidents, injuries and *Disciplinary Actions*. Audits also help to identify the effectiveness of *Disciplinary Action Program and Policies* and can be used as a guide to assure regulatory compliance and a safe workplace.

a. Management

- Design and schedule audit and inspection procedures for all processes and procedures
- Conduct routine audits and inspections
- Ensure audits are conducted by employees who understand the various safety programs and policies

b. Supervisors

- Conduct informal daily safety inspections and ensure all unsafe conditions are corrected
- Conduct documented weekly inspections and ensure all unsafe conditions are corrected

c. Corrections

- All safety deficiencies found during audits and inspections should be corrected as soon as possible
- Conditions that present a hazard are to be corrected or controlled immediately, and
- Documentation of corrections should be made available to OSHA inspectors and affected personnel upon demand

3.1.1 Safety Violation

The following actions constitute a safety violation:

- Not following verbal or written safety procedures, guideline or rules of Robinson Brothers Construction, Inc. services or our clients
- Horseplay,
- Failure to wear required PPE, and or abuse of PPE
- Being under the influence of drugs or alcohol during work
- Bringing weapons on the job site
- Failure to report incidents or injuries
- Attempted or actual physical force to cause injury, threatening statements or other actions to cause an employee to feel they are at risk of injury.

The above actions are to be reviewed against a sliding twelve-month scale. If an employee receives a warning on January 1 and commits his third offense on or before December 31st of the same year, the employee is terminated.

The employee does not have to commit the same violation each time to receive further warnings. The employee will be terminated upon his third offense in the last twelve months.

In the case of serious safety violations such as by-passing guarding or other unsafe activities that put the violator or other employees at serious risk of injury, the manager may move the violator directly to the second or third warning level.

If the violator's actions put him or others at risk of death or dismemberment the manager has the option to terminate him with no further warning.

Note: follow the steps in Sections *(5.1 – 5.1.3.1)* to address safety violations actions and *Appropriate Control Measures*

4.0 TRAINING

Training can reduce the need for disciplinary action. Robinson Brothers Construction, Inc. shall instruct employees in:

- The importance of workplace safety and health
- The need to develop safety habits
- The company's operations
- The safe work practices, and hazards they control, and
- The standards of behavior that the company expects

The company employees must understand the disciplinary system and the consequences of any deliberate, unacceptable behavior.

5.0 PROCEDURE

5.1 Appropriate Control Measures

Robinson Brothers Construction, Inc. focus is on a clear understanding of the rules and the consequences of breaking those rules. Which allows Robinson Brothers Construction, Inc. to avoid vagueness, to establish consistency and fairness.

5.1.1 Counseling and Verbal Warning

Will stay in effect for 12 months. (**Examples)** of offenses that may lead to a verbal warning include:

- Tardiness
- Unauthorized absence from the job
- Failure to maintain satisfactory & harmonious working relationships with the public or other employees
- Smoking in unauthorized areas
- Failure to punch time clock
- Foul and abusive language
- Inefficiency, incompetence or negligence in the performance of duties

5.1.2 The Verbal Warning:

- Creates an opportunity for the immediate supervisor to schedule a meeting with an employee to bring attention to the existing performance, conduct or attendance issue.
- The supervisor should discuss with the employee the nature of the problem or violation of company policies and procedures.
- Listen to the employee's response and make a note of it. Further, investigate the situation if appropriate.
- The supervisor clearly states that this constitutes a verbal warning.
- The supervisor is expected to clearly outline expectations and steps the employee must take to improve the performance or resolve the problem.
- The supervisor will state the consequences of failure to demonstrate immediate and sustained improvement.
- The supervisor will document the conversation and follow up within 2 days with the verbal warning document recapping the meeting.
- The document will indicate that failure to demonstrate sustained improvement will lead to further disciplinary action.

5.1.2.1 Deliver the Verbal Warning

- If e-mailed, ask the employee to acknowledge the receipt of the verbal warning.
- If a hard copy is given, encourage the employee to sign.
- If the employee refuses to acknowledge or sign the document, acknowledge this on the document,

sign, and forward the document to Human Resources.

- Keep a copy for your file.

5.1.3 The Written Warning

- State clearly at the outset of the letter that it is a written warning
- Describe for the employee the performance/behavior problem(s) or work rule violation(s) in a very specific manner
- Make reference to previous counseling and verbal warning(s) on the issue
- Listen to and make a note of employee's explanation, make any expectations regarding behavior and performance clear.
- Management will outline the consequences for the employee of his or her continued failure to meet performance and/or conduct expectations.
- A formal *Performance Improvement Plan* (PIP) requiring the employee's immediate and sustained corrective action will be issued within five business days of the step 2 (warning) meeting.
- Clearly tell the employee that if immediate and sustained corrective action is not taken the consequence will be further disciplinary action, up to and including dismissal.

5.1.3.1 Deliver the Written Warning

- Deliver the written warning to the employee
- obtain the signature, and
- send the document to Human Resources to placed the Written Warning in the employee's file
- Should the employee choose not to sign the warning, acknowledge this on the document, sign it, and send to Human Resources

5.1.4 Recommendation for Termination of Employment/Discharge

The last and most serious step in Robinson Brothers Construction, Inc.'s *Disciplinary Action Program and Policy* process is a recommendation to terminate employment.

Generally, Robinson Brothers Construction, Inc. will try to exercise the disciplinary action nature of this policy by first providing warnings, final written warning and/or suspension from the workplace before proceeding to a recommendation to terminate employment.

However, Robinson Brothers Construction, Inc. reserves the right to combine and skip steps depending upon the circumstances of each situation and the nature of the offense. Furthermore, employees may be terminated without prior notice or disciplinary action.

Note: Behavior that is illegal is not subject to the *Disciplinary Action Program and Policy* and may be reported to local law enforcement.

Management's recommendation to terminate employment must be approved by HR and division director or designated personnel. **(Examples)** of offenses that may lead to immediate dismissal or dismissal following Disciplinary Action includes:

- Continued failure to demonstrate and sustained improvement following a written warning
- The behavior persists
- Sexual harassment
- Intoxication or use of illegal drugs on the job
- Fighting or other acts of violence
- Gross Insubordination
- Wilful destruction of company property
- Theft
- Gross misconduct unbecoming of a Robinson Brothers Construction, Inc. employee
- Releasing confidential or sensitive information that could be damaging or embarrassing to the company
- Conviction of a felony charged by a court of proper jurisdiction provided the felony is relevant to the position.
- Carrying a concealed weapon to the job
- Falsifying time cards
- Falsification, fraud or omission of information in applying for a position
- Misappropriation of company funds or resources
- Use of undue influence to gain or attempt to gain promotion, leave, favorable assignment or other individual benefit or advantage
- Failure to report to work without notification for a period of three days
- Job abandonment
- Failure to obtain or maintain a current license or certificate required by law or Robinson Brothers Construction, Inc. standards as a condition of employment.
- Any other act which endangers the safety, health or well-being of another person or which is of sufficient magnitude that the consequences thereof cause or act to cause disruption of work or gross discredit to Robinson Brothers Construction, Inc.

5.1.5 Suspension (May be used by Exception)

If necessary, supervisors may suspend an employee until an investigation has been completed. There may be performance, conduct or safety incidents so problematic and/or harmful that the most effective action may be the temporary removal of the employee from the workplace.

If the immediate action is necessary to ensure the safety of the employee or others, or to diffuse a possibly volatile situation, the immediate supervisor may suspend the employee pending the results of an investigation.

Depending on the seriousness of the infraction, the employee may be suspended without pay in full-day increments, typically 1 – 5 days, consistent with federal, state and local wage-and- hour employment laws.

Non-exempt/hourly employees may not substitute or use an accrued paid vacation or sick day instead of the unpaid suspension. Due to Fair Labor Standards Act (FLSA) compliance issues, unpaid suspension of salaried/exempt employees is reserved for serious workplace safety or conduct issues.

HR will provide guidance so that the discipline is administered without jeopardizing the FLSA exemption status.

Note: Pay will be restored to the employee in an unpaid suspension if an investigation of the incident or infraction absolves the employee.

5.2 Informing the Employee

Inform the employee of the corrective action, both verbally and in writing, as soon as possible after the disciplinary decision has been reached. The purpose is to outline what is wrong, what corrective action is being taken, and what is expected in the future.

As a supervisor, keep close control of your emotions, avoid sarcasm, threats, nagging, getting into an argument with the employee, or loss of temper. With the obvious exception of a termination of employment, the purpose of the disciplinary action is to re-establish safety, health, and a harmonious workplace.

5.3 Appeal Process

Employees may appeal any step of the process in accordance with Robinson Brothers Construction, Inc.s' Human Resources Policy

6.0 RECORDKEEPING

6.1.1 Documentation

All documentation of corrective action should be included in the employee's personnel file at Human Resources and the department. The record has three parts:

- The present
- The past, and
- The future

a. The Present

- This section states the purpose of the corrective action and cites the specific incident or nature of the problem
- In recounting the incident or problem, include what occurred and when, how it affected the work activity, the results of the investigation, and the employee's explanation
- State only the facts that can be proven and/or have been observed

This section also cites the specific rule, policy, or standard violated, and disciplinary action being taken as a result of the employee's actions. Stress the significance of the problem and the reason for the corrective action.

b. The Past

- This section reviews the employee's work record, gives the history of related offenses (if any), and reminds the employee of previous disciplinary actions taken.
- This summary of past events demonstrates the progressiveness of the corrective action.

c. The Future

- Finally, the employee must have a clear understanding of the expected standard of behavior or performance, how this standard can be achieved, and the consequences of continued failure to meet these expected standards.
- Write in easily understood language, emphasize the "do" rather than the "don't," and focus on the future rather than the past. In other words, use a tone of correction, not punishment.

Note: Keep a record of any relevant situations that occur once you have initiated the *Disciplinary Action Program* process.

These notes should give all the necessary pertinent information (including when it was brought to the employee's attention). The notes should be dated and signed and kept in the supervisor's file.

Note: All documentation of corrections found while preforming the Workplace Audits and Inspections should be made available to OSHA inspectors and affected personnel upon demand.

7.0 REFERENCES

1.	**Documents & External References** UNH Performance Management Toolkit - Constructive Discipline, Corrective Action & Documentation, Disciplinary-action-guidelines. v2-5.2016, https://www.osha.gov/dte/grant.../sh.../creating_a_safety_program.ppt,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document. If any clarification is required for changes made to the previous documents.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This program is written to be in compliance with local regulatory requirements and provide directives to managers, supervisors, and employees about their responsibilities in the operations and management of Robinson Brothers Construction, Inc. vehicle safety.

1.1 Scope

Only authorized employees will drive a motor vehicle in the course and scope of work or operate a company owned vehicle. While driving on company business, Robinson Brothers Construction, Inc. expects its employees to comply with local traffic regulations, while also being conscious of general safe driving practice. The following actions are viewed as serious breaches of conduct:

- Being under the influence of drugs or alcohol while driving
- Driving while disqualified or not correctly licensed or insured
- Driving without proper care and control of the vehicle
- Driving without regard for local traffic regulations
- Failing to stop after an accident.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
None	None.

2.1 Responsibilities

2.1.1 Employer

- Ensure the Company's Safety Officer (CSO) develops and maintain a Defensive Driver Program and related procedures. These procedures are kept in the designated HSE's office.

2.1.2 Site Manager

The Manager has the responsibility for ensuring that any mobile equipment owned, leased, rented or hired by Robinson Brothers Construction, Inc.:

- Complies with all relevant Occupational Health and Safety (OH&S) requirements
- Is operated only by a qualified person, trained in the use and maintenance of that equipment and who is experienced in the type of work to be performed, and

- Responsible for the implementation and maintenance of the program for their site and ensuring all assets are made available for compliance with the plan
- Ensure that the periodic inspection is performed annually during the company's site-specific audit
- Ensure all procedures pertaining to Safe Driving shall be reviewed (and updated when necessary) at a minimum of every three years

2.1.3 Employees

An employee who drives as part of his/her Robinson Brothers Construction, Inc. business will:

- Each employee shall be familiar with this procedure and the local workplace vehicle safety program.
- Follow all requirements, report unsafe conditions, and follow all posted requirements.
- Ensure the driver holds a current driving license valid for the class of vehicle being operated.
- Immediately notify his/her supervisor if the license is suspended, canceled or has limitations placed upon it, or if he/she has personal limitations (e.g. difficulty driving at night or driving on icy roads, driving standard transmission vehicles, the use of medications that cause drowsiness, etc.).
- Perform and document a *Vehicle Inspection Checklist (See Appendix 1),* before each trip, which also includes taking the time to become familiar with the vehicle (including its safety features).
- Report vehicle defects (rental cars) to the rental company before the start of the trip.
- Always wear your seat belt while operating a vehicle, and ensure all passengers wear seat belts.
- Ensure the number of passengers never exceeds the number of available seat belts.
- Ensure that passengers are transported only in the vehicle cab.
- Report motor vehicle accidents and traffic violations as required by the company Driving Safety Program.
- Always park in a drive-out position (reverse into the parking stall). When reversing, the driver of a truck or towed equipment must sound the horn.
- Be directly responsible for the safe operation of the vehicle, while observing all relevant regulations (e.g. obeying posted speed limits). This includes verification that loads are secured and within the vehicle manufacturer's specification and legal limits for the vehicle.
- Ensure that where a personal vehicle is used for work, company policy regarding insurance coverage and operating use are observed.
- Assess driving hazards and anticipate "what if scenarios." Be alert and attentive.
- Always secure the vehicle when not behind the wheel (e.g. put the vehicle in 'park' or 'in gear' and turn off the engine when not required to be running, use emergency brake and/or chock wheels, roll up windows, lock doors, etc.).
- Take an accident report form on all trips.

- Immediately report any incident (including those that do not result in damage or injury) to the Risk Management, HSE and his/her supervisor, and follow-up with a completed Incident Report.
- Report motor vehicle accidents as required to the local police. Include a copy of any police report in incident reports to HSE.

3.0 SAFETY

3.1 Hazards

Driver hazards include:

- Drowsiness and fatigue
- Distractions within or around the vehicle
- Environmental conditions (e.g. weather, landscape topography, vegetation, etc.)
- Road (or Route) conditions
- Alcohol and/or drug consumption
- Other drivers in the area
- Pedestrians, and wildlife
- Vehicle condition
- Lack of driving skill
- Size and type of vehicle

3.1.1 Emergency Equipment

Vehicles should be equipped with appropriate emergency equipment for use in the event of mechanical failure, crash, or other circumstance that results in a disabled vehicle near the roadway. List items to be included, such as warning triangles, first aid kit, fire extinguisher, and other equipment depending on vehicle type and use.

4.0 TRAINING

All employees who drive company vehicles and those who drive personal or rental cars for business more than 80 hours a year shall receive Defensive Driver training:

- This training shall be refreshed if the employee is involved in an at-fault accident.
- Defensive Driver training shall be provided via a corporate-approved provider.
- All Robinson Brothers Construction, Inc. employees who are required to drive a vehicle on work related business must complete a “Recognized Defensive Driving Course” every three years.
- All new hires are expected to complete the training before driving any company vehicles.
- All Robinson Brothers Construction, Inc. employee Driver Training will be documented.
- The Company HSE Director is required to maintain their driver training documentation and provide it to the Line Managers upon request for audit or inspection purposes.

Note: Any defensive driving course other than the company's Driving Course must be approved by the Robinson Brothers Construction, Inc. HSE Director.

5.0 PROCEDURE

5.1 Written Policies and Procedures

A written statement emphasizing the commitment to reducing traffic-related deaths and injuries is essential to a successful program. Create a clear, comprehensive, and enforceable set of written traffic safety policies and communicate them to all employees. Distribute policies to all employees and discuss them as often as possible. Consider incentives for sticking to the rules and point out the consequences of disregarding them.

5.1.1 Driver Agreements

Establish a contract with all employees who drive for work purposes, whether they drive assigned organizational vehicles, pool vehicles, or personal vehicles. By signing an agreement, the driver acknowledges awareness and understanding of the organization's policies.

5.1.2 Motor Vehicle Driving Record (MVR) Checks

Check the motor vehicle record (MVR) of all employees who drive for work purposes. Drivers with poor driving records must be screened out because they are the most likely to cause problems in the future. The MVR should be reviewed periodically to ensure the driver maintains a clean driving record. Clearly, define the number of violations an employee/driver can accumulate before losing driving privileges.

5.1.3 Drowsiness

- Plan ahead and take into consideration pre-trip work duties, the length of the trip and post-trip commitments.
- When driving long distances, consider traveling the day before, or stay over an extra day.
- Stay overnight if driving time, and non-driving duties exceed 16 hours or 500 miles (805 km) in one day. If for unavoidable reasons you have to drive over these limits, approval must be obtained from your supervisor.
- It is the responsibility of each employee to ensure that he/she comes to work rested and alert to carry out work duties safely.
- When driving, take regular and adequate rest breaks.
- At least 15 minutes for each 2-hour driven.
- Stop when tired.
- Share driving if traveling with other employees.
- At no time, should an employee put him/herself in a position where he/she feels unsafe, whether it is on location or driving to a location.
- If an employee is requested by a Client to drive to its location and he/she believes the road conditions are unsafe, the employee should discuss the matter with his/her supervisor.

5.1.4 Distractions

Driving distractions can assume multiple forms inappropriate use of electronic devices such as a cellular phone or any other electronic device to make a phone call, text a message, read email messages, manipulate music files or search for information. Also, eating, drinking, putting on makeup, reading a newspaper, operating any other electronic device, or some other type of distracting activity where the driver's mind, eyes, and hands are engaged elsewhere than the road ahead and the steering wheel.

Using a hands-free phone while driving, does not significantly reduce risks because the problems are caused mainly by the mental distraction and divided attention. Mobile phones cause distractions in three ways:

- Taking hands off the wheel
- Becoming engrossed in a conversation and not concentrating on the road
- Mental distraction

a. The use of mobile phones while driving is prohibited:

- The only exception to this rule when it is necessary to contact law enforcement, medical, or other emergency personnel.
- Phones should be switched off while the vehicle is in motion, which will divert all calls to voicemail.
- The driver should pull off the road (in a safe position) to make a call or take a call.
- Drivers should also be aware that if they have an accident while using a cell phone, they will be held accountable for all repairs and citations resulting from the accident.
- The use of any portable electronic device (including BlackBerries, cell phone and laptops) for texting or emails while driving is prohibited. GPS, radios, and portable music devices shall be set up before driving, adjusting them while driving is prohibited.

5.1.5 Environmental and Road Conditions

- Drivers must adapt when conditions deteriorate due to bad weather or otherwise. Ensure the vehicle is in good condition and be aware of weather and road conditions.
- The internet is a good tool to assess weather conditions along the route. Tune into regional radio stations to gain further awareness of accidents and road closures in that area.
- Check the condition of wipers and volume of washer fluid. For snowy conditions, ensure there is a brush with scraper, a shovel, and where necessary, a blanket and adequate survival gear.
- Do not exceed posted speed limits and always maintaining a safe distance between other vehicles.
- The following distance should be increased in bad weather. Be patient and slow down.
- If you cannot see, do not drive.

- Remember that puddles can hide dangerous potholes.
- Use your headlights and beware of other drivers.

a. Be aware that the surrounding landscape can affect your safety:

- Ensure that the vehicle is the correct size and designed for intended use,
- Ensure you park your vehicle safely on the firm ground, in gear where appropriate, and always use the emergency brake.
- When on a hill facing down, turn wheels to the curb/ditch.
- When facing uphill, turn wheels to the centerline.
- Chock your wheels and use traffic cones where necessary.
- Where possible, position your vehicle such that you have a clear line of sight for oncoming vehicles, while always ensuring the ability to safely exit and enter the vehicle.
- If an employee is required to drive a vehicle to a hazardous location where fire or explosion hazards may exist due to flammable gases, vapors, combustible or flammable liquids, combustible dust or ignitable fibers. The vehicle **MUST** be parked outside the hazardous location.

5.1.6 Alcohol and Drug Use

Robinson Brothers Construction, Inc. employees are prohibited from operating a motor vehicle while under the influence of alcohol, illegal drugs or certain medications.

5.1.7 Other Drivers, Pedestrians, and Wildlife

The defensive driver assumes that pedestrians and other drivers may make mistakes and is on guard in the event an error is made. The defensive driver will:

- Anticipate that pedestrians or wildlife may do the unexpected.
- Scan around the vehicle thoroughly when a pedestrian is present. Pedestrians may walk or stand in a vehicle's blind spots.
- Adjusting driving speed at a safe speed will help avoid pedestrians or wildlife. It is difficult for pedestrians to judge how fast a vehicle is approaching.
- Yield the right-of-way to the pedestrian or the wildlife.
- Be extra careful at night as pedestrians may assume a driver can see them since they can see the vehicle headlights so easily.
- Be vigilant at all times for presence of wildlife; never assume they will act predictably.

5.1.8 Vehicle Condition

Check vehicle regularly and before each Long-Haul Trip. Checks should include:

- Tire inflation
- Cleanliness of windows

- Mirror adjustment
- Function of horn, lights, and brakes (including emergency brake)
- Fluid levels, including washer fluid, engine oil, brake fluid, transmission fluid, power steering fluid, fuel, etc.
- Condition of windshield wipers and washer fluid
- Closure of doors, trunk, and tailgate
- General condition and functionality of vehicle
- Before each Trip, complete Robinson Brothers Construction, Inc.s Vehicle Pre-Use Checklist.
- All defects in company vehicles must be noted in the vehicle logbook and made known to the relevant supervisor who in turn will ensure repairs are completed according to manufacturers' specifications.
- Ensure that all loads, tools, material or equipment are secured against movement or stored in tool or gang boxes. Particular attention must be paid to transporting gasoline.
- Ensure vehicles are of the correct size and designed for intended use.

5.2 Crash Reporting and Investigation

Establish and enforce a crash reporting and investigation process:

- All crashes, regardless of severity, shall be reported to the employee's supervisor as soon as possible after the incident.
- Company policy should clearly guide drivers through their responsibility after a crash.
- All crashes should be reviewed to determine the cause, their preventability, and what can be done to avoid similar crashes in the future.

5.2.1 Towing

- Towing of anything shall be prohibited unless the vehicle is specifically designed and equipped for the task.
- Vehicles designed and equipped for towing shall only tow approved trailers
- Do not attempt to pull stuck vehicles with any other vehicle than a tow-truck. Chains can snap, and vehicles not designed for towing can be damaged.

5.2.2 Transportation of Employees

Employees and materials or tools must not be transported in the same compartment of a vehicle except where approved seating is provided for the employees, and the material or tools are secure against movement.

- A vehicle driver or passenger must not ride with any part of the body outside the vehicle.
- Employees must not board or leave any vehicle while it is in motion.
- Except for cases of dire emergency, seriously injured or ill persons shall be transported for medical treatment by ambulance only.

Vehicles that are used for transporting employees must have within the enclosed portion of the vehicle:

- Effective ventilation (independent of doors) to provide clean air
- Adequate lighting and means of heating and cooling

5.2.3 Outside Authorities to Be Contacted

In addition to any required internal reports, employees shall report all motor vehicle accidents to the appropriate local authorities.

Copies of accident reports to local authorities shall be obtained and forwarded for inclusion in the internal incident report.

5.2.4 Traffic Control

Robinson Brothers Construction, Inc. shall develop, in writing, and implement a traffic protection plan for its workers at a worksite if any of them may be exposed to a hazard from vehicular or pedestrian traffic that may endanger the safety of any worker. It shall include the following control measures:

- Effective means of traffic control shall be provided whenever the unregulated movement of vehicular traffic constitutes a hazard to workers.
- Traffic control shall include barricades and cones as the primary control and, where required, signs, flagmen or other techniques and devices made necessary by the prevailing circumstances.
- Operations or equipment, encroaching on the traveled way, shall be protected by barricades and cones as the primary control and, where required other effective devices.
- Robinson Brothers Construction, Inc. must train workers in the traffic control safe work procedures.
- Robinson Brothers Construction, Inc. will ensure that before a worker is designated as a flag person, the worker is trained in the safe work procedures for the safe control of traffic operations and wears the appropriate high visibility outer clothing and/or equipment.
- If a worker at a project on a highway may be endangered by vehicular traffic unrelated to the project, the project shall make use of as many measures as necessary to adequately protect the worker.
- A worker who is required to set up or remove traffic control measures on a roadway or a shoulder of a roadway shall be:
  - A competent worker,
  - Shall be equipped with the appropriate high visibility apparel,
  - Shall not perform any other work while setting up or removing the measures, and
  - Shall be given adequate written and oral instructions in a language that he or she understands, with respect to setting up or removing the measures.

5.2.5 ATV Vehicles

If a Robinson Brothers Construction, Inc. work site utilizes ATV vehicles, then the following shall apply:

- If the manufacturer has not set limits for operation of the ATV on sloping ground, 5% is the maximum allowable slope unless the has developed and implemented written safe work procedures appropriate for any steeper slope on which the equipment is to be used.
- Robinson Brothers Construction, Inc. must ensure that each ATV operator is properly licensed and trained in the safe operation of the vehicle. The training program for an ATV operator must cover:
    - The employees pre-trip inspection,
    - Use of personal protective apparel,
    - Operating skills according to the ATV manufacturer's instructions,
    - Basic mechanical requirements, and
    - Loading and unloading the vehicle, if this is a job requirement.
- An ATV operator and any passenger on an ATV must wear approved eye and hearing protection as required by local regulatory requirements and the Robinson Brothers Construction, Inc. PPE Program.
- An ATV operator and any passenger on an ATV must wear clothing suitable for the environmental conditions and when necessary to protect against the hazards presented at the worksite, suitable gloves and clothing which covers the ankles and legs and the arms to the wrists and appropriate footwear.
- Robinson Brothers Construction, Inc. requires that approved helmets shall be worn by the operator and passenger.
- Loading and unloading of an ATV onto or off a carrier vehicle must be done in a safe manner.
- If ramps are used when loading or unloading an ATV, they must be placed at a suitable angle, be sufficiently wide and have a surface finish which provides an adequate grip for the ATV's tires.

5.3 Vehicle Selection, Maintenance, and Inspection

Selecting, properly maintaining, and routinely inspecting vehicles are an important part of preventing crashes and related losses. Organizations should review and consider the safety features of all vehicles before inclusion on the selector list.

Vehicles should be placed on a routine preventive maintenance schedule for servicing and checking safety-related equipment. A vehicle technician should perform a thorough inspection at least annually, and the results should be documented in the vehicle file. Personal vehicles used for business should be maintained in a safe working order similar to fleet vehicles.

5.4 Disciplinary Action System

Introduce and enforce a disciplinary action system that includes a predetermined course of action after the occurrence of a moving violation or preventable crash.

The majority of these programs are based on a point system, with points assigned that correlate with the infraction severity. In many cases, the threshold is set so that one very serious infraction (e.g., DWI) disqualifies the employee from driving on company business.

5.5 Reward/Incentive Program

Because safe driving behaviors contribute directly to the bottom line, many organizations reinforce safe driving behaviors by investing in a reward or incentive program. Positive results are realized when an individual's driving performance is incorporated into overall job performance evaluations.

6.0 RECORDKEEPING

A. File these records in the Office Safety File:

- **a.** Driver MVR check performed as pre-employment screening, held in HR files
- **b.** Vehicle Pre-Use Checklist- non-project-based drivers

B. File these records in the Project Health & Safety File:

- **a.** Vehicle Pre-Use Checklist- project-based drivers

7.0 REFERENCES

1.	**Documents & External References** *www.mississippi.edu/rm/downloads/.../motor_vehicle_fleet_mgt_best_practices.pdf*, *www.oshatrain.org/notes/fleetsafetyplan.html*, ***roadsafetyatwork.ca/wp-content/.../TripCheck-Hard-Copy-form-JS1-Oct-14-14.pdf,*** *https://www.osha.gov/Publications/motor_vehicle_guide.html*

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Vehicle Inspection Checklist

VEHICLE INSPECTION CHECKLIST

Line Manager: _____ Date Inspected: _____

Vehicle Description & License #: _____ Vehicle Mileage: _____

Item	OK	N/A	Needs Repair (Yes/No)	Comments (describe & assign action if repair is needed)
Vehicle Registration				
Valid License Plates				
Insurance information (self				
Tires (Inflation, tread depth)				
Seat Belts				
Operator's Manual				
Maintenance Records				
Springs				
Shocks				
Exhaust System				
Engine				
Steering				
Horn				
Mirrors				
Mobile Radio				
Fire Extinguisher				
Brakes working				
Parking Brake				
Windshield Wipers				
Windshield				
Washers				
Headlights: Hi/Lo				
Turn Signals				
Brake Lights				
Backup Lights				
Instrument Lights				
Tail Lights				
Body Condition				

Backup Alarm				

Robinson Brothers Construction, Inc.		
ELECTRICAL SAFETY		
Version: 1.0	**Date Approved:** 28 November 2016	Health, and Safety Environmental **CSO:** Joe Bergren

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title
AUTHOR: Name & Title

1.0 PURPOSE

The purpose of the program is to ensure that the proper protective measures and work procedures are followed when working on or near energized or potentially energized equipment. The following company policies were developed from OSHA Standard as well as NFPA 70E.

1.1 Scope

This applies to qualified and non-qualified employees with the potential of exposure to electricity through the inspection, testing, troubleshooting installation of equipment, operation of switches, controllers, Lockout Tagout procedures, power supply installations or maintenance, and have the distinctive chance of direct exposure to energized parts.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Approach Distances	The distance established whenever work is to be conducted on electrical systems or components, not in an electrically safe work condition.
Flash Protection Boundary	Distance beyond which appropriate flash protection equipment is required to present severe 2nd-degree burns.
Limited Approach Boundary	Shock protection boundary designed to keep nonqualified persons at a safe distance away from exposed electrical components. Only qualified workers are allowed within this boundary.
Restricted Approach Boundary	Secondary shock protection measure whereby accidental movement can put a body part or conductive object in contact with live parts. Approach distances listed in Table 1 represent minimum distances required between energized parts to an unprotected person or equipment. Only qualified personnel with proper protective equipment is allowed within this boundary.
Disconnecting means	A device by which the conductors of a circuit can be disconnected from their source of electrical supply. As an energy isolation control, it shall have the capability of being locked out.
Enclosure	A case or housing of apparatus surrounding an installation to prevent personnel from accidentally contacting energized parts. If the enclosure is conductive, it must be grounded or bonded to a grounding system.
Exposed	Capable of being inadvertently touched or approached nearer than a safe distance by a person. Not insulated.
Ground	A conducting connection to the earth.
Guarded	Covered, shielded, fenced, enclosed to otherwise protected using suitable covers, casings, barriers, rails, screens, mats or platforms used to remove the likelihood of approach to the point of danger or contact by persons or objects.
Isolated	Not readily accessible to persons unless special means of access are used.

Non-Qualified Worker	One who is not exposed to hazards and will not approach exposed parts of electric circuits operating at 50 volts or more to ground.
Outlet	A point on the wiring system at which the current is taken to supply utilization equipment.
Qualified Worker	One who has demonstrated an understanding of construction and operation of the equipment and has full knowledge of the associated hazards.

2.1 Responsibilities

- The *OSH Act* requires employers to provide their workers with a workplace that is free of serious hazards
- The employer shall determine, through regular supervision and inspections conducted at least on an annual basis, that each employee is complying with the safety-related work practices required when working on or near energized or potentially energized equipment
- The employer shall ensure that the employee in charge conducts a job briefing with the employees involved before they start each job
- The company is also responsible for providing personal protective equipment (PPE)

2.1.1 Site Project Manager and Supervisor

The Site Project Manager and Supervisor are to ensure that employees are in compliance with the safe work practices and the requirements in this policy plan. In addition, they are also responsible for performing the annual review, revise the Electrical Safety Program along with ensuring training and retraining are made available to qualified and unqualified employees.

2.1.2 Employees

- Follow the safe work practices and requirements of this policy
- Understand all procedure, standards and safe work practices that pertain to their respective job assignments
- Ensure that they are current on training and certifications

3.0 SAFETY

3.1 Personal Protective Equipment (PPE)

Personal protective equipment shall be used to protect from electrical hazards that have not been eliminated by de-energizing or guarding. All personal protective equipment shall be inspected before each day's use and immediately following any incident.

3.1.1 Eye Protection

Plastic rimmed safety glasses with side shields meeting ANSI Z87 standards shall be used at all times while working on or near exposed live parts. *(Hazard Rating 0-4)*

3.1.2 Face Protection

- A tinted arc shield with a balaclava-style hood shall be worn when working where there are dangers of flying objects from an electrical arc for (Hazard Rating 1 or 2) hazards
- Safety glasses shall be worn in conjunction with the shield. A full FR hood (beekeeper style) shall be used for high incident energy levels in category 3 or 4. (Hazard Rating 1-4)

3.1.3 Head Protection

Non-conductive hard hats shall be worn where employees are exposed to electrical conductors that could contact the head such as when working on open bus work. (Hazard Rating 0-4)

3.1.4 Hearing Protection

Arc-rated hearing protection is required for all electrical switching of devices or where exposed to energized electrical parts rated greater than 50 volts.

3.1.5 Insulated Equipment

- Rubber gloves rated for the voltage shall be worn when working within the restricted approach boundary on exposed parts with voltages over 50 volts
- Rubber gloves shall be air tested before each day use and dielectrically tested every 6 months (or every month if used in mine facilities governed by MSHA, Title 30 of the Code of Federal Regulations)
- Class 0 rubber gloves may be used for voltages up to 750 volts (or 1000 volts DC)
- Class 2 rubber gloves are required for voltages greater than 750 volts but less than 15,000 volts, however, direct contact with energized parts using rubber gloves with voltages exceeding 750 volts from a ground position is prohibited. (Hazard Rating 0-4)
- Insulated barriers (rolled rubber material) approved for use on energized equipment may be used to isolate the employee from the energized parts instead of using rubber gloves to avoid contact on lower voltages. Rubber gloves shall be used to install barrier material. (Hazard Rating 1-4)

3.1.6 Clothing

Only natural fiber clothing (cotton or wool) shall be used at a minimum while working near exposed live parts including undergarments. Also, if conditions dictate that an arc flash hazard exists, arc-rated (AR) clothing may be required. (See ***Table 3*** for HRC levels and calorie/cm² ratings).

Table 3. Protective Clothing Requirements

HAZARD RISK CATAGORY	CLOTHING DESCRIPTION	Minimum ATPV*
0	Untreated cotton clothing	N/A
1 and 2	AR shirt and AR pants or AR Coveralls	8
3 and 4	AR switching coat and pants, Arc Hood	40

* ATPV – Arc Thermal Performance Exposure Value AR – Arc Rated

3.1.7 Hot-Line Tools

- Hot line tools shall be used to test voltages or place protective grounds on systems greater than 600 volts
- An approved hot-line voltage tester connected to a hot-stick (shotgun) shall be used to verify that all circuits to be worked on are de-energized
- The tester shall first be brought into contact with a live source (if possible) to ensure it operates correctly, then it shall be put into contact on all phases of the previously energized parts and then again to an energized source

- If no such source is available, the self-test method shall be utilized by engaging the test mechanism on the tester

3.1.8 Grounding for Protection

- No work may be performed on any electrical components rated at greater than 600 volts without first testing to ensure parts are de-energized (USING ONLY A VOLTMETER RATED FOR THE VOLTAGE), then installing grounds to all previously energized part
- Effective barricades shall be in place to avoid contact with any other source of electrical energy before attempting to install grounds. Temporary grounding equipment shall be tested every 3 years

3.1.9 Foot Protection

Safety-toe leather boots shall be worn at all times:

- Electrical Hazard rated boots shall be considered to provide additional resistance for protection of the worker
- Extreme care shall be maintained in the immediate area where hazardous step potential or voltage gradients on the earth may be present
- Short heel-to-toe steps will minimize gradient potential and should be used when a fault occurs on medium voltage equipment

3.1.10 Additional Safety Requirements

Includes the use of signs and barriers:

- Safety symbols or signs shall be prominently displayed to warn employees about electrical hazards
- This may include warning signs on panel doors, doors to electrical rooms or any hazardous location which may endanger employees
- If signs are not in place on customer-owned equipment, and voltage is unknown, covers or doors shall not be opened until these voltages are determined

3.1.11 Protective Shields, Protective Barriers, or Insulating

Protective shields, protective barriers, or insulating material shall be used to protect employees from shock, burns or electrically related injuries while the employee is working near exposed energized live parts.

Note: Conductive barricades shall not be used. Barricades i.e. "Danger Tape" shall be used to prevent non-qualified workers from entering an electrical exposure limited approach boundary.

4.0 TRAINING

The training requirements contained in this section apply to employees who face a risk of electric shock that is not reduced to a safe level by electrical installation requirements. Employees that face such a risk are required to be trained. Other staff who may reasonably be expected to face comparable risk of injury due to electric shock or other electrical hazards must also be trained.

4.1 Type of Training

- Employees shall be trained in and familiar with the safety-related work practices required by 1910.331 through 1910.335 that pertain to their respective job assignments.
- The training required by this section may be of the classroom or on-the-job type. The degree of training provided must be determined by the risk to the employee.

4.1.1 Content of Training

Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials shall be capable of working safely on energized circuits and shall be familiar with the proper use of special techniques such as:

- Each qualified electrical worker shall be instructed in CPR,
- First aid,
- AED and
- Techniques needed to safely release victims
- Personal protective equipment
- Insulating and shielding materials, and
- Insulated tools

5.0 PROCEDURE

To ensure that the proper protective measures and work procedures are followed when working on or near energized or potentially energized equipment The following procedures pertain to both qualified and non-qualified personnel unless distinctively referenced to qualified employees.

5.1 Job Briefing

Before each job assignment of employee or a group of employees, the management shall provide the employee responsible for the job with all the information that relates to the determination of existing characteristics and conditions required to perform the job. The employee in charge shall conduct a job briefing with all staff involved before they start each job.

5.1.1 Subjects to be Covered

The briefing at a minimum, shall include following topics:

- hazards associated with the job
- work procedures involved
- special precautions
- energy source controls, and
- personal protective equipment requirements

5.1.2 Extent of Briefings:

- If the job or operations are being performed throughout the work day, and the shifts are repetitive and recurring, before the start of the first job of each day or shift
- a briefing shall be conducted.

- A job briefings shall be held if significant changes, which might affect the safety of the employees, occur during the work as well.

5.1.3 Scope of Briefing

A brief discussion is satisfactory if the work involved is routine and if the employees, training, and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more detailed discussion shall be conducted:

- If the work is complicated or particularly hazardous, or
- If an employee cannot be expected to recognize and avoid the hazards involved in the job.

The briefing must address all the subjects involved in the job assignment.

5.1.4 Working Alone

An employee working alone need not conduct a job briefing. However, the employer shall ensure that the tasks to be performed are planned as if a briefing were required.

5.2 Selection and Use of Safe Work Practices

Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from electrical contacts.

1. A thorough inspection of all equipment shall be done to evaluate for potential hazards. Ensure the integrity of all enclosures and insulation.

2. Live parts to which an employee may be exposed shall be de-energized by a qualified worker as specified in the Lockout Tagout Program before the employee works on or near them unless a greater hazard is introduced. Only qualified workers are allowed to complete tasks such as testing, voltage measuring, and troubleshooting within the limited approach boundary. The qualified employee shall test to ensure that the previously energized part is de-energized using a UL listed meter rated for the voltage being tested. Testers shall be verified in good condition by testing before and after the test at a known source. Conductors and parts of electrical equipment that have been de-energized but not been locked or tagged out shall be treated as live parts.

3. If it is not feasible to de-energize exposed live parts, other safety-related work practices shall be used to protect the exposed employees. Only qualified personnel are allowed to work where exposed to energized equipment. Procedures utilized to perform this job shall include special precautionary techniques such as the use of personal protective equipment, insulating and shielding material or insulated tools. An Energized Work Permit ***(Attached Form A)*** shall be completed before beginning this work. The form is not required for troubleshooting or testing processes.

4. Employees may not enter spaces containing exposed energized parts unless an illumination is provided that enables the employees to perform the work safely.

5. Employees working in confined or enclosed spaces shall de-energize or effectively barricade with protective shields, insulating materials or barriers for any exposed live parts. Doors or hinged panel shall be secured to prevent swinging freely.

6. Conductive materials and ladders shall be handled in such a manner that will prevent them from encroaching clearances as specified in ***(Table 1.)*** Only non-conductive ladders are allowed for use near energized parts.

7. Conductive apparel articles of jewelry and clothing (such a watch bands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, or metal headgear) may not be worn if

they might contact exposed energized parts. However, such articles may be worn if they are rendered nonconductive by covering, wrapping, or other insulating means.

8. Working on energized parts rated at 50-600 volts shall only be performed by qualified personnel who have had specific training on the particular parts and equipment to be worked on. The qualified employee's supervisor shall be contacted, and an energized work permit (Attached Form A) shall be completed before starting work on energized equipment with exceptions including testing, troubleshooting, and inspections.

9. Work on exposed energized systems greater than 600 volts is not permitted unless specifically trained. Two qualified workers are required to open/close, rack out/in, test, and install temporary grounds on medium voltage equipment. Before grounding and working on medium voltage parts as de-energized, the components must be tested using a proper tester rated for the voltage with a hot stick only.

10. Unqualified personnel are restricted from access to exposed energized parts of voltages greater than 50 volts. Qualified staff shall place a barricade, guard energized parts or have an attendant to prevent unqualified personnel from encroaching the limited approach or flash protection boundary, whichever is greater.

11. If work is to be performed near overhead lines, the lines shall be de-energized and grounded, or other protective measures shall be provided before work is started.

12. When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the individual and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

    - For voltages to ground 50kV or below - 10 feet (305 cm)
    - For voltages to ground over 50kV - 10 feet (305 cm) plus 4 inches (10 cm) for every 10kV over 50kV

13. Blind reaching is not allowed in any electrical panels or equipment.

14. All Troubleshooting (and or) Testing above 50 Volts require voltage insulating gloves and other appropriate PPE.

15. Inform the host employer if a hazardous condition is introduced or identified including corrective measures taken or required to make the condition safe.

16. All personnel shall maintain 10 feet from overhead power lines including handheld equipment and vehicles. (see ***Table 1*** limited approach boundary listed in ***Table 1***)

Table 1. Approach Boundary to Live Parts for Shock Protection

VOLTAGE RANGE Phase to Phase	LIMITED APPROACH BOUNDRY	RESTRICTED APPROACH BOUNDRY	MIN. FLASH PROTECTION BOUNDARY
0 - 50	Avoid Contact	Avoid Contact	N/A
51 - 250 volts	3 ft. 6 in. (1 m)	Avoid Contact	4 ft. (1.2 m) *
251 - 750 volts	3 ft. 6 in. (1 m)	1 ft. 0 in. (.3 m)	10 ft. (3.3 m) *
751 - 15,000 volts	5 ft. 0 in. (1.5 m)	2 ft. 2 in. (.7 m)	10 ft. (3.3 m) *

*** If an arc flash study has been completed, the arc flash boundary shall be as indicated on the arc flash label.**

5.3 Vehicular and Mechanical Equipment

Any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines shall be operated so that a clearance of 10 ft. (305 cm) is maintained. If the voltage is higher

than 50kV, the clearance shall be increased 4 in. (10 cm) every 10kV over that voltage. However, under any of the following conditions, the clearance may be reduced:

- If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (122 cm). If the voltage is higher than 50kV, the clearance shall be increased 4 in. (10 cm) for every 10 kV over that voltage.
- If the insulating barriers are installed to prevent contact with the lines, and the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure. The clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.
- If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in ***Table S-5***.

TABLE S-5 - Approach Distances for Qualified Employees - Alternating Current

Voltage range (phase to phase)	Minimum Approach Distance
300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

5.4 Use of Portable Electric Equipment

This section applies to cord and plug connected Equipment.

1. This equipment shall be handled in a manner which will not cause damage.
2. Avoid raising and lowering the equipment using flexible cords. Do not fasten cords with staples or other fasteners that may damage the outer jacket.
3. Portable cord and plug equipment shall be inspected before use. If damaged is detected it shall be removed from service. Extension cords shall periodically be given a continuity test along with the inspection to determine open points or short circuits (test for full continuity on each wire and zero continuity from wire to wire).
4. Grounded type tools or equipment shall have the grounded-type plug and shall be inspected to ensure compatibility with the receptacle. Adapters which interrupt the continuity of the equipment grounding connection may not be used.
5. Portable electric equipment and flexible cords used in highly conductive work locations (such as those inundated with water or other conductive liquids), or in job locations where employees are likely to contact water or conductive liquids, shall be approved for these sites:
    - Employees' hands may not be wet when plugging and unplugging flexible cords and cord and plug connected equipment if energized equipment is involved.

- Energized plug and receptacle connections may be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand (if, for example, a cord connector is wet from being immersed in water). Locking type connectors shall be properly secured after connection.

5.5 Power and Lighting Circuits

Where power and lighting are involved the use of circuit breakers and fuses are included.

1. Load rated circuit breakers shall be used for opening and closing circuits. Fuses, terminal lugs and cable splice connections shall not be used to make or break load.
2. After a circuit, has been de-energized by a circuit protective device, the circuit shall not be reenergized until it has been determined safe to do so by a qualified employee.
3. Only qualified persons may perform testing work on electric circuits or equipment. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee may use it until repairs and tests necessary to render the equipment safe have been made. Test instruments and equipment and their accessories shall be rated for the circuits and equipment to which they will be connected and shall be designed for the environment in which they will be used.
4. Where flammable materials are present only occasionally, electric equipment capable of igniting them shall not be used, unless measures are taken to prevent hazardous conditions from developing. Such materials include, but are not limited to:
    - Flammable gases
    - Vapors, or
    - Liquids
    - Combustible dust, and
    - Ignitable fibers or flying's
    - Materials shall not be stored on equipment. Before removing covers, any materials shall be removed

5.6 Safeguards for Personal Protection

Includes the use of personal protection equipment (PPE). Selected employees will be furnished with and shall use PPE at all times.

The level of PPE used is determined by conducting a hazard assessment and choosing a level of protection that significantly reduces or eliminates the risk of injury related to the hazard. Conducting a job briefing and consulting the information in this program before performing any work will determine the risks associated with the job.

This process in conjunction with information on the Tables within this program will assist in determining the level of protection needed to work with or near electrical apparatus.

See Table 2 to determine hazard risk classifications and PPE requirements. A simplified program is used as follows:

- If the task is identified by a hazard risk category of 1 or 2, the qualified employee shall wear HRC 2 protect equipment

- If the task is identified by a hazard risk category of 3 or 4, the qualified employee shall wear HRC 4 protective equipment

Table 2. Hazard Risk Category Classification

TASK	RATING
Electrical work on systems rated 240 volts or less include: Operate circuit breakers or fused switches and disconnects with doors closed, cable trough or tray cover removal, work on control circuits 120 volts or less.	**0**
Working on electrical systems rated at 240 volts or less include removal of bolted covers on control circuit enclosures and voltage testing.	**1**
Working on or near exposed energized parts rated at 600 volts or less where exposed to electrical parts where the arc flash hazard is determined to be less than 8 cal/cm² and no physical work is performed that may cause a severe arc flash, and that is not listed in HRC 3 or 4 categories.	**2**
Working on or near exposed energized parts rated at 600 volts or less including removing bolted covers on exposed 480-volt cabinets where the hazard risk category is greater than 8 cal/cm² or unknown, open cover to exposed parts of an ATS, racking in or out 480-volt generator breakers on an energized bus.	**3**
Work on exposed parts rated greater than 25 cal/cm² including energized parts of pad-mounted 480-volt transformers, main switchgear bus, racking in or out medium voltage breakers and transfer switches, phasing or other energized work, testing and grounding with a hot stick.	**4**

Note 1: ***Table 2*** may be used where available fault current is less than 25,000 amps. If fault current exceeds 25 kA an engineering study must be performed to determine the arc flash hazard.

Note 2: The hazards may be identified on an equipment label where an arc flash study has been conducted. This data will take precedence over information in ***Table 1.***

5.7 Lockout Tagout

A qualified employee shall also demonstrate knowledgeable of the construction and operation of equipment and specific work methods associated with the electrical task. Employees who are not qualified persons shall also be trained in and familiar with any electrically related safety practices not specifically addressed in this document but are necessary for their safety. Qualified individuals (i.e., those permitted to work on or near exposed parts) shall, at a minimum, be trained in, and familiar with the following:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment by identifying exposed conductive parts that are isolated from ground and performing a voltage test
- The skills and techniques necessary to determine the nominal voltage of exposed live parts by examining labels, nameplates, one-line diagrams, or for medium voltage, as well as the construction, and spacing. Colored tape may be an indicator but should not be relied upon to determine nominal voltage
- The approach boundaries specified in ***Table 1*** and the corresponding voltages to which the qualified person will be exposed
- The proper inspection, donning and uses of personal protective equipment including EH hardhat, arc protection equipment and clothing, rubber gloves and insulating materials and tools

- Whenever there is a change in the energy control procedures and workplace requires different safe work practices than the employee would usually use

5.7.1 Frequency of Training

For this document, a person must have the above training to be considered qualified. Qualified employees shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments:

- New hires shall be trained upon assignment.
- Refresher training shall be done if a deficiency is identified during an audit but should not exceed three (3) years
- Training shall be documented

6.0 RECORDKEEPING

A demonstration of employee's knowledge shall be documented. This can be via written test, documentation of successful completion of training, and by on-site demonstration of understanding through workplace observations. Each employee shall be evaluated at least annually to ensure continued understanding. See below the records the employer must retain and how long the company must maintain them:

The employer must keep the following records	For at least
i. Current lockout/tags-plus program and procedures	Until replaced by updated program and procedures
ii. Training records	Until replaced by updated records for each type of training
iii. Incident investigation reports	Until the next program, or an audit is completed
iv. Program audit report	12 months after being replaced by the next audit report

The employer shall make all records required by this section available to employees, their representatives, and the Assistant Secretary in accordance with the procedures and time periods specified in 29 CFR 1910.1020(e)(1) and (e)(3).

6.1.1 Compliance

All electrical work shall be done to electrical standards. All electrical work will be performed by qualified personnel only. Qualified employees will conduct on-site training.

Conscientious observance of electrical safety procedures is expected of all qualified and nonqualified employees, neglecting these responsibilities may subject the individual to serious injury. Failure to follow these procedures may result in disciplinary action. Retraining will be conducted when:

- An employee is not in compliance with 's safe work practices.

7.0 REFERENCES

1.	**Documents & References** OSHA Subpart S, and NFPA 70E Standards, CFR 29 1926.960 - Working on or near exposed energized parts, CFR 29 1910.333-Electrical Selection and use of work practices, CFR 29 Electrical Training, CFR 29 1910.334 Use of equipment, 1910.269 Special Industries, Electrical-safety-program-sample, Train-The-Trainer Manual 2, osha2254 (1), 10_elec_standard2

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendment

9.0 APPENDICES

Energized Work Permit (form A)

PART 1 TO BE COMPLETED BY THE REQUESTER

Job/Work Order Number_____

1. **Description of circuit/equipment/job location: _____**
2. **Description of work to be done: _____**
3. **Justification of what the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage: _____**

PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK	Check when Complete
1. Detailed job description procedure to be used in performing the above detailed work: _____	☐
2. Description of the safe work practices to be employed: _____	☐
3. Results of the flash shock hazard analysis: _____	☐
4. Determination of shock protection boundaries: _____	☐
5. Results of the flash hazard analysis: _____	☐

6. Determination of the flash protection boundaries: ☐ **_____**
7. Necessary personal protective equipment to safety perform the assigned task: ☐ **_____**
8. Means employed to restrict the access of unqualified person from the work areas: ☐ **_____**
9. Evidence of completion of job briefing including discussion of any job-related hazards: ☐ **_____**
Do you agree the above described work can be done safely? ☐ Yes ☐ No (if no, return to requester)
Electrically Qualified Person(s) **Date:** **PART III: APROVAL(S) TO PREFORM THE WORK WHILE ELECTRICALLY ENERGIZED**
Manufacturing Manager: _____ Maintenance /Engineering Manager: _____
Safety Manager: _____ Electrically Knowledgeably Person: _____
General Manager: _____ Date: _____ **Note: Once the work is complete, forward this form to the site Safety Department for review and retention.**

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to provide fall protection procedures to prevent injury to employees while performing work assignments at elevated levels.

Any changes to this Fall Protection Program must be approved by the HSE Manager, who is designated the *Qualified Person*. This is based on training received in fall protection planning and has demonstrated skills and knowledge in the preparation of fall programs, plans and the hazards involved.

1.1 Scope

Applies to all "Company" employees who have work assignments at work levels that exceed 6 feet in height where guardrails or nets are not utilized. This includes work near and around excavations. Guardrails, safety nets, or personal fall arrest systems shall be used where feasible. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers "Company" employees and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Anchorage	a secure point of attachment for lifelines, lanyards or deceleration devices.
Body harness	straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.
Connector	a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).
Deceleration Distance	the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
Equivalent	means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
Free fall	the act of falling before a personal fall arrest system begins to apply force to arrest the fall.
Free fall distance	vertical displacement of the fall arrest attachment points on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and

	lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
Guardrail system	a barrier erected to prevent employees from falling to lower levels.
Infeasible	means that it is impossible to perform the inspection work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.
Lanyard	a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.
Leading edge	the edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to an "unprotected side and edge" during periods when it is not actively and continuously under construction.
Lifeline	a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
Lower levels	those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
Personal fall arrest system	a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
Qualified Person	is based on training received in fall protection planning and has demonstrated skills and knowledge in the preparation of fall programs, plans and the hazards involved.
Safety Nets	Safety nets shall be provided when workplaces are higher than 25 feet above ground or water surfaces or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines or safety belts are impractical. Nets shall extend 8 feet beyond the edge of the work surface where employees are exposed and shall be installed as close under the work surface as practical but in no case more than 25 feet below the work surface. Nets shall be positioned in a manner to prevent the user from coming into contact with below surfaces or structures. Proper clearance positioning of nets shall be determined by impact load testing. Work procedures shall not begin until nets are in place and have been properly tested. New nets shall meet accepted performance standards of 17,500 foot pounds' minimum impact resistance as determined and certified by the manufacturers and shall bear a label of proof test. Edge ropes shall provide a minimum breaking strength of 5000 pounds
Snap-hook	a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap-hooks are generally one of two types: **(1)** The locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or

	(2) The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection.
Note: As of January 1, 1998, the use of a non-locking snap-hook as part of personal fall arrest systems and positioning device systems is prohibited.	
Walking/working surface	any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, where employees must be located to perform their job duties.

2.1 KEY Responsibilities

It is the responsibility of the "Company" to ensure that a (designated competent person) implements this Fall Protection Program. Continual observational safety checks of work operations and the enforcement of the safety policy and procedures shall be regularly enforced. All jobs shall be pre-planned prior to the start of work.

2.2 Supervisor

- The Supervisor shall ensure that all persons assigned to work at elevated levels, exceeding 6 feet in height or more above lower level and where guardrails or nets are not utilized, be protected by personal fall protection equipment.
- Supervisors shall make exposure determinations and shall discuss with their employees the extent to, which scaffolds, ladders or vehicle mounted work platforms can be used.
- Ensure that fall protection equipment is available and in safe working condition.
- Provide for emergency rescue in the event of a fall. Pre-plan the job to ensure that employees have been properly trained in the use, limitations, inspections and rescue procedures and that training records are on file.

2.3 Employees

- Employees shall ensure they have and use the fall protection equipment as required by this program and:
- Understand the potential hazards of working at elevated levels as well as gaining access to and from the work location.
- Understand the use and limitations of such equipment.
- Pre-plan the job with his/her supervisor to agree that the job can be done safely.
- Inspect such equipment before each use and to report defective equipment immediately to their supervisor.

3.0 SAFETY

3.1 Safety Monitoring System

When the use of conventional fall protection equipment is deemed infeasible or the use of this equipment creates a greater hazard a Fall Protection Plan which includes a safety monitoring system shall be implemented by the supervisor.

Supervisors shall designate a competent person to monitor the safety of other employees. The competent person shall be assigned to:

- Recognize fall hazards;

- Warn employees if they are unaware of fall hazard or are acting in an unsafe manner;
- Be on the same working surface and in visual contact of working employees;
- Stay close enough for verbal communication; and
- Not have other assignments that would take his/her attention from the monitoring function.

3.2 Rescue

Prompt rescue of employees shall be provided in the event of a fall or shall assure the employees are able to rescue themselves. The pre-planning stage prior to the beginning of each elevated work assignment shall be evaluated by the supervisor to provide rescue of employees involved in a fall.

4.0 TRAINING

Employees who may be exposed to fall hazards shall be trained to recognize the hazards of falling and understand the procedures to be followed in order to minimize these hazards. The employee will be trained in the use and operation of fall arrest systems, inspections, and maintenance procedures.

Training must be conducted initially and refresher training conducted annually or as needed due to deficiencies in training, changes in the workplace, changes in fall protection systems or procedures that render previous training obsolete or inadequacies in an employee's understanding of previous training. Training must be documented in writing. Training records shall include:

- Who was trained
- When and dates of training
- Signature of person providing training
- Date training was deemed adequate

  Training records shall be retained in the corporate office.

4.1 Incident Investigations

All incidents and near misses must be investigated according to Robinson Brothers Construction, Inc.s' incident investigation procedure. Changes to the fall protection program shall be implemented if deemed appropriate from incident corrective actions.

5.0 PROCEDURE

Fall protection is required whenever employees are potentially exposed to falls from height of six feet or greater to lower levels. This includes working near and around excavations. Use of guard rails, safety net, or personal fall arrest systems should be used when the standard methods of protection are not feasible or a greater hazard would be created.

5.1 Minimum Standards

The following are minimum standards for Robinson Brothers Construction, Inc.s' employee personal fall protection systems:

- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
- Connectors shall have a corrosion resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds.

- D-rings and snap hooks shall be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snap-hooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snap hook. Only a locking type snap hook designed and used to prevent disengagement of the snap hook by the contact of the snap hook keeper by the connected member shall be used.
- Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. Where vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Lifelines shall be protected against being cut or abraded.
- Devices that automatically limit free fall distance to 2 feet or less such as Self-retracting lifelines and lanyards, shall be capable of tolerating a minimum tensile load of 3,000 pounds when applied to the device with the lifeline or lanyard in the fully extended position.
- Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet or less, rip stitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Anchorages intended for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system, which provides a safety factor of at least two and under the supervision of a qualified person.
- Systems used by an employee having a combined person and tool weight in excess of pounds shall be modified to provide proper protection for such heavier loads.
- The attachment point of the body harness shall be located in the center of the wearer's back near shoulder level, or above the wearer's head, except when climbing.
- Body harnesses and components shall be used only for employee protection and not to hoist materials.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
- Provide for prompt rescue of employees in the event of a fall or assure that employees are able to rescue themselves.
- Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
- Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists unless prior approval is obtained from a competent person.
- If and when a personal fall arrest system is utilized at hoist areas, it shall be rigged to permit the movement of the employee only as far as the edge of the walking/working surface.

5.2 Stopping a Fall

The arresting force on an employee stopped by a fall shall be limited to:

- a maximum arresting force of 1,800 pounds when wearing a body harness.
- The fall arrest system shall be rigged such that an employee can neither free fall more than 6 feet, nor contact any lower level.
- The fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.
- The fall arrest system shall have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

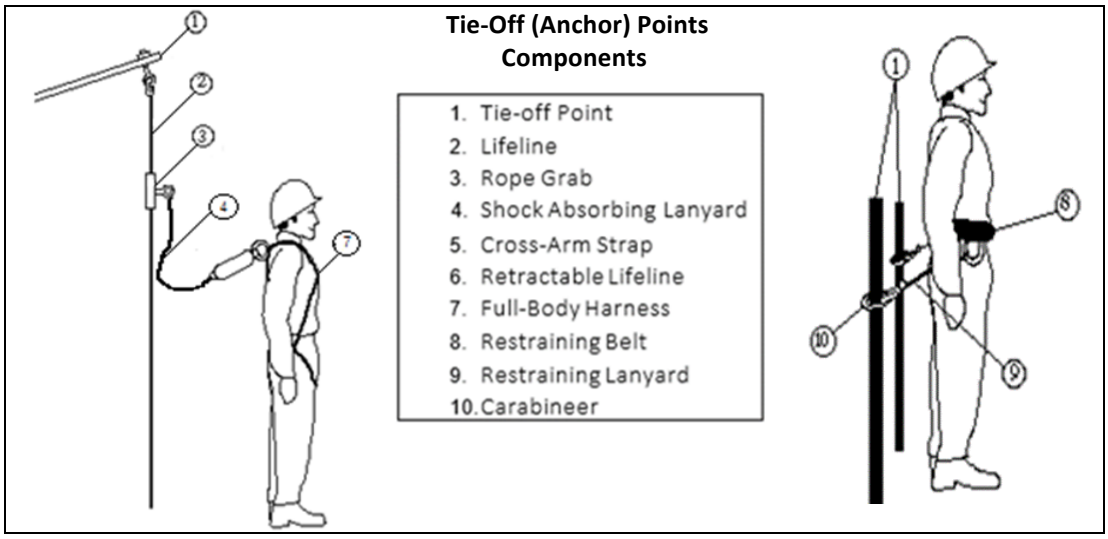
When purchasing equipment and raw materials for use in fall protection systems applicable ANSI, ASTM or OSHA approved equipment shall be used.

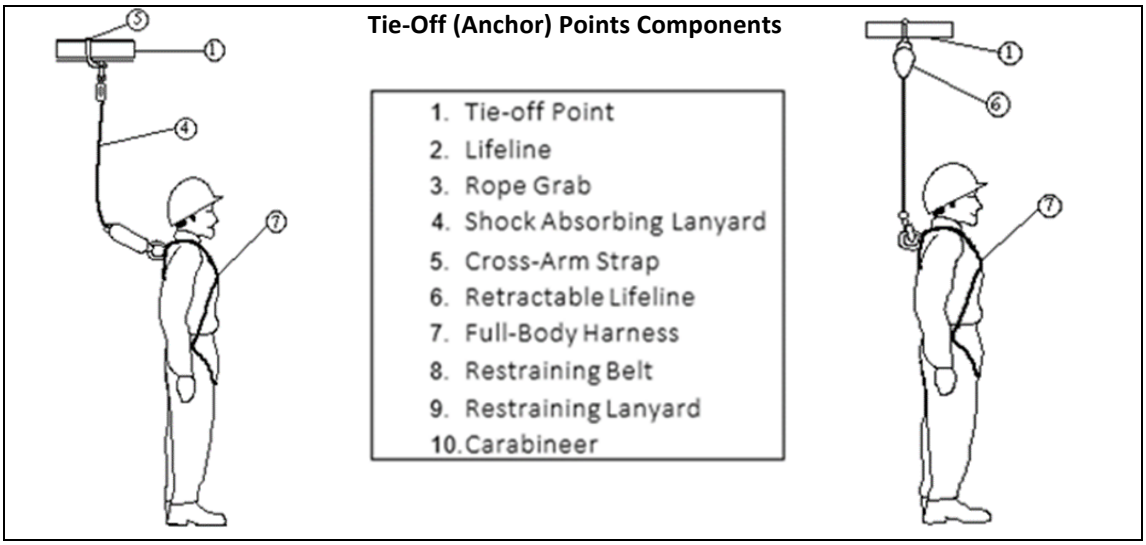
5.3 Fall Protection Plan

This option is available only to employees engaged in leading edge work who can demonstrate that it is infeasible or it creates a greater hazard to use conventional fall protection equipment. The fall protection plan shall conform to the following provisions:

- The fall protection plan shall be prepared by a qualified supervisor and developed specifically for the site where the leading edge work is being performed.
- The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.
- The fall protection plan shall identify each location where conventional fall Protection methods cannot be used.

  These locations shall then be classified as controlled access zones.





5.4 Protection from Falling Objects

When employees are required to work in the near vicinity of others working with materials, tools, or equipment at elevated levels, Barricades around the immediate area of the overhead work shall be erected to prohibit employees from entering the barricaded area.

Employees performing work at elevated levels shall keep tools, materials, and equipment away from the edge to keep potential objects from falling over the side. Where practical, tools, etc. shall be secured with rope, wire, etc. to keep them from falling.

a. Elevated Personnel Platforms

Work performed, regardless of the nature of the work, from personnel platforms raised by forklifts, cranes, scissor lifts, etc., shall require the use of a full body harness and shall be connected to the platform

b. Portable Ladders

Three-point climbing is required while ascending/descending ladders. While on ladders, both hands and one foot, or both feet and one hand shall always be in contact with the ladder.

Tools required to perform a task shall be transported by a mechanical carrier such as a tag line, suspended bucket or tool belt.

- Tools shall not be carried by hand while climbing.
- Hands must be free to grip the ladder.
- Tools shall not be carried in clothing pockets.
- Tools shall be pulled up to the job site only after reaching the area of work.

When work is to be performed from straight/extension ladders, fall protection shall be utilized when heights exceed 6 feet.

Straight ladders shall be tied off at the top to prevent them from moving. A second person shall steady the ladder at the base while it is being tied off at the top by another employee. Do not tie off all protection equipment to the ladder.

c. Storage

A dedicated storage area shall be provided for the storage of fall protection equipment and all components. The storage area shall keep the equipment clean, dry, and free from oils, chemicals, paints, and excessive heat.

d. Inspections

Fall protection equipment shall be inspected before each use for wear, damage, other deterioration, or other defects.

5.5 Controlled Access Zones

When used to control access to areas where leading edge or other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.

When control lines are used, they shall be erected not less than 6 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge.

The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a guardrail system or wall.

- Control lines shall consist of ropes, wires, tapes, or equivalent materials.
- Each line shall be flagged or otherwise clearly marked at not more than 6 foot (1.8 m) intervals with high visibility material.
- Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m).
- Each line shall have a minimum breaking strength of 200 pounds.
- Only employees engaged in the related work shall be permitted in the controlled access zone.

6.0 RECORDS KEEPING

Training records shall include:

- Who was trained
- When and dates of training
- Signature of person providing training
- Date training was deemed adequate

Training records shall be retained and shall be readily available for authorized persons to review. The following information is maintained as a result of this process:

- The employer shall maintain all employee training records for one (1) year beyond the last date of employment by that employer.
- The employer shall make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.
- The employer shall provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.

7.0 REFERENCES

1.	**External References** OSHA CFR (29) 1926.500-503 subpart M, Fall Protection

	https://www.grainger.com/content/qt-fall-protection-equipment-130, Fall Protection ANSI, ASTM or OSHA, Title: Confined Space Entry - reagansafety.com, http://reagansafety.com/PEP_SAFETY_MANUAL/Policies/PDF/0000, 22_Confined_Space_En (accessed September 26, 2016).

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

None

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of the Fire Protection Extinguishers procedure is to set forth procedures for the use, care, and maintenance of Fire Protection Extinguishers required to be used by employees for the prevention and safety of Robinson Brothers Construction, Inc. and its employees.

1.1 Scope

This scope applies to all Robinson Brothers Construction, Inc. employees while focusing on fire protection, which involves fire brigades, and all portable and fixed fire suppression equipment, fire detection systems, and fire or employee alarm systems installed. This procedure meets the fire protection requirements of 29 CFR Part 1910.

Note: Also, this applies to all employments except for maritime, construction, and agriculture.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Approved	Acceptable to the Assistant Secretary under the following criteria: • If it is accepted, or certified, or listed, or • Labeled or otherwise determined to be safe by a nationally recognized testing laboratory
Class A Fire	A fire involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials.
Class B Fire	A fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials.
Class C Fire	A fire involving energized electrical equipment where safety to the employee requires the use of electrically nonconductive extinguishing media.
Class D Fire	A fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium.
Extinguisher Classification	The letter classification given an extinguisher to designate the class or classes of fire on which an extinguisher will be effective.
Fire Brigade (private fire department, industrial fire department)	An organized group of employees who are knowledgeable, trained and skilled in at least basic firefighting operations.
Fixed Extinguishing System	A permanently installed system that either extinguishes or controls a fire at the location of the system.
Incipient Stage Fire	A fire which is in the initial or beginning stage and which can be controlled or

	extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.
Multipurpose Dry Chemical	A dry chemical which is approved for use on Class A, Class B, and Class C fires.
Positive-Pressure Breathing Apparatus	Self-contained breathing apparatus in which the pressure in the breathing zone is positive in relation to the immediate environment during inhalation and exhalation.
Sprinkler System	A system of piping designed in accordance with fire protection engineering standards and installed to control or extinguish fires. The system includes an adequate and reliable water supply, and a network of specially sized piping and sprinklers which are interconnected. The system also includes a control valve and a device for actuating an alarm when the system is in operation.

2.1 Responsibilities

2.1.1 Employers

The employer shall prepare and maintain a written policy statement which:

- Establishes the fire brigade and its organizational structure
- Defines the functions to be performed, and
- States training program requirements

The employer must assure that employees who are expected to do interior structural fire fighting are physically capable of performing duties

3.0 SAFETY

3.1 Fire Fighting Equipment

The employer shall:

- Maintain and inspect, at least annually,
- Fire fighting equipment to assure safe operational condition of the equipment.
- Portable fire extinguishers shall be inspected at least monthly
- Respirators shall be inspected at least monthly

3.1.1 Protective Clothing

- These requirements apply to those employees who perform interior structural fire fighting.
- These requirements do not apply to employees who use fire extinguishers or standpipe systems to fire incipient level fires.

3.1.2 Protective Clothing

- Foot and leg protection

- Body protection
- Hand Protection
- Head, eye and face protection

3.1.3 Respiratory Protection Devices

The employer shall assure that respiratory protection devices worn by fire brigade members meet the requirements of 1910.134

- A minimum rating of 30 minutes
- Requires use of 2 in 2 out rule

4.0 TRAINING

4.1 Training and Education

- Shall be conducted prior to assignment, for any employee required to use fire extinguishers
- Retraining at least annually
- Quarterly training or education sessions are required for fire brigades expected to perform interior structural fire fighting

4.1.1 Portable Fire Extinguisher Training

Where portable fire extinguishers have been provided for employee use in the workplace, employees must be provided with a training program on the:

- General principles of fire extinguisher use
- Hazards of incipient (beginning) stage fire fighting
- Employees designated to use extinguishers must receive instruction and hands-on practice in the operation of equipment

4.1.2 Training and Instruction

Employees shall be trained in:

- Use of extinguishers and Associated Hazards
- Initially and Annually
- Employees designated to use fire fighting equipment shall be trained

5.0 PROCEDURE

5.1 General Requirements

- Mount, locate and identify extinguishers so that they are readily accessible
- Only approved extinguishers shall be used
- Maintain extinguishers in a fully charged and operable condition

5.1.1 Portable Fire Extinguishers

5.1.1.1 Selection and Distribution

- Based on Classes of anticipated workplace fires
- On size and degree of hazard

a. Extinguishers shall be distributed so that maximum travel distances apply:

- **Class A** - 75 feet
- **Class B** - 50 feet
- **Class C** - Based on appropriate pattern
- **Class D** - 75 feet

5.2 Before Using a Fire Extinguisher

- The fire department has been called
- You have announced the fire to alert others
- Occupants have begun evacuating or are leaving the structure
- The fire is small and not spreading
- You know how to operate the fire extinguisher, and
- The fire won't block your unobstructed escape route

5.2.1 Types of Fires

5.2.2 Class A Fires

They are fires in ordinary combustibles such as wood, paper, cloth, trash, and plastics.

5.2.3 Class B Fires

They are fires in flammable liquids such as gasoline, petroleum oil, and paint. Also, included are flammable gases such as propane and butane. Class B fires do not include fires involving cooking oils and grease.

5.2.4 Class C Fires

They are fires involving energized electrical equipment such as motors, transformers, and appliances. Remove the power and the Class C fire becomes one of the other classes of fire.

5.2.5 Class D Fires

They are fires in combustible metals such as potassium, sodium, aluminum and magnesium.

5.2.6 Class K Fires

They are fires in cooking oils and greases such as animal fats and vegetable fats.

5.3 Name Types of Extinguishers

5.3.1 Dry Chemical

Fire extinguishers extinguish the fire primarily by interrupting the chemical reaction in the fire. Today's most widely used type of fire extinguisher is the multipurpose dry chemical that is effective on Class A, B and C fires. This agent also works by creating a barrier between the oxygen element and the fuel element on Class A fires.

The ordinary dry chemical is for Class B & C fires only. It is important to use the correct extinguisher for the type of fuel! Using the incorrect agent can allow the fire to re-ignite after apparently being extinguished successfully.

5.3.2 Water and Foam

Fire extinguishers extinguish the fire by taking away the heat from the fire. Foam agents also separate the oxygen from the fuel and heat. Water extinguishers are for Class A fires only; they should not be used on Class B or C fires. The discharge stream could spread the flammable liquid in a Class B fire or could create a shock hazard on a Class C fire. Foam extinguishers can be used on Class A & B fires only. They are not for use on Class C fires due to the shock hazard.

5.3.3 Carbon Dioxide

Fire extinguishers extinguish the fire by separating the oxygen element from the fuel and heat, and also by removing the heat with a very cold discharge. *Carbon dioxide can be used on Class B & C fires. They are usually ineffective on Class A fires.*

5.3.4 Wet Chemical

Is a new agent that extinguishes the fire by removing the heat from the fire and prevents re-ignition by creating a barrier between the oxygen and fuel elements. *Wet chemical or Class K extinguishers were developed for modern, high efficiency deep fat fryers in commercial cooking operations. Some may also be used on Class A fires in commercial kitchens.*

5.3.5 Halogenated or Clean Agent

Extinguishers are either based on halocarbon agents or the older and no longer made Halon 1211 agent, which can no longer be used for training. Halocarbon agents replaced Halon 1211 within the last 8 years and are much more environmentally acceptable. Commercialized halocarbon agents extinguish the fire by removing heat from the combustion zone. Halon 1211 extinguishers, however, were chemically active and interfered with the chemical reactions occurring in the combustion zone. Halocarbon and halon 1211 extinguishers are effective on Class A, B, and C type fires, although very small sizes do not achieve the lowest UL Class A rating, 1-A.

5.3.6 Dry Powder

Extinguishers are similar to dry chemical except that they extinguish the fire by separating the fuel from the oxygen element of the fire. However, dry powder extinguishers are for Class D or combustible metal fires, only. They are ineffective on all other classes of fires.

5.3.7 Water Mist

Extinguishers are a recent development that extinguishes the fire by taking away the heat from the fire. They are an alternative to the clean agent extinguishers where contamination is a concern. Water mist extinguishers are primarily for Class A fires, although they are safe for use on Class C fires as well.

5.4 Maintaining Portable Fire Extinguishers

- Must be maintained in a fully charged and operable condition
- Must be kept in their designated places at all times except during use
- Must conduct an annual maintenance check
- Must record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less

5.5 Inspection, Maintenance, and Testing

5.5.1 Hydrostatic Test Intervals

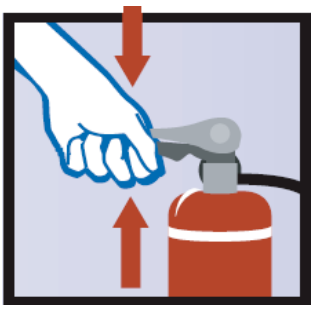
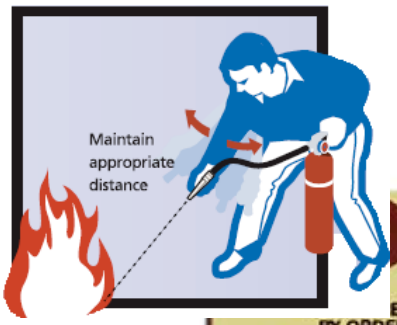
Depending on the type(s) of extinguishers you have, they must be emptied and hydrostatically tested at the intervals specified in Table L-1. Extinguisher any shells, cylinders, or cartridges failing a hydrostatic pressure test, or which are not fit for testing, shall be removed from service and workplaces. Extinguishers shall be:

- Visually inspected monthly
- Maintained annually
- Hydrostatically tested periodically

(See Appendices 1 for Table L-1)

5.6 How to Use a Fire Extinguisher

When It is Time to Use a Fire Extinguisher, Just Remember PASS

PULL Pull the pin.	
AIM **Aim** the nozzle or hose at the base of the fire from the recommended safe distance.	
SQUEEZE **Squeeze** the operating lever to discharge the fire extinguishing agent.	
SWEEP Starting at the recommended distance, **Sweep** the nozzle or hose from side to side until the fire is out. Move forward or around the fire area as the fire diminishes. Watch the area in case of re-ignition.	

6.0 RECORDKEEPING

For each extinguisher in the workplace you must keep a record that includes:

- The name of the person or agency who performed the last hydrostatic test, and the test date.

- The signature of the person who performed the test.
- The serial number or another identifier of the fire extinguisher that was tested.

This information should also be securely fixed to each extinguisher and provided upon request to the Assistant Secretary as evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table L-1. These records must be kept until the extinguisher is hydrostatically retested at the time interval specified in Table L-1 or until the extinguisher is taken out of service, whichever comes first. ***(See Appendices 1 for Table L-1)***

Test carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers every five years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders that comply with 49 CFR 173.34(e) (15) may be hydrostatically tested every 10 years.

7.0 REFERENCES

1.	**Documents & External References** *1910.161 - Fixed Extinguishing Systems, Dry Chemical, 1910.162 - Fixed Extinguishing Systems, Gaseous Agent, 1910.163 - Fixed Extinguishing Systems, Water Spray and Foam, 1910.164 - Fire Detection Systems, and 1910.165 - Employee Alarm Systems, femalifesafety.org/docs/**ExtBrochure**.pdf* https://www.osha.gov/SLTC/etools/evacuation/portable_hydro.html,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Table L-1

Table L-1

Type of extinguishers	Test interval (years)
Soda acid (soldered brass shells) (until 1/1/82)	*
* Soda acid (stainless steel shell)	5
* Cartridge operated water and/or antifreeze	5

Type of extinguishers	Test interval (years)
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (soldered brass shells) (until 1/1/82)	*
Foam (stainless steel shell)	5
Aqueous Film Forming Foam (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon Dioxide	5
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated with mild steel shells	12

***FOOTNOTE**: Extinguishers having shells constructed of copper or brass joined by soft solder or rivets shall not be hydrostatically tested and shall be removed from service by January 1, 1982. (Not permitted)*

- Although still included in Table L-1, Soda acid (stainless steel shell) and Cartridge operated water, and/or antifreeze extinguishers are now obsolete.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The purpose of this program is to establish the minimum first aid supplies, equipment and actions to properly respond to injuries.

1.1 Scope

This program applies to all Robinson Brothers Construction, Inc. employees while engaged in work at Robinson Brothers Construction, Inc. facilities and/or facilities operated by others.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
None	None.

2.1 Responsibilities

2.1.1 Manager

- It is the responsibility of the site manager to ensure that first aid kits are provided and maintained.
- All employees are responsible for using first aid materials in a safe and responsible manner.
- The HSE Manager is responsible for corresponding with the Red Cross or an equivalent to keeping employee training levels current.

2.1.2 Site Manager

- It is the responsibility of the site manager to ensure that first aid kits are provided and maintained.
- All employees are responsible for using first aid materials in a safe and responsible manner.
- The HSE Manager is responsible for corresponding with the Red Cross or an equivalent to keeping employee training levels current.
- Ensure that a minimum of one employee, with a valid certificate, shall be present to render first aid at all times work is being performed if medical assistance is not available within 3-4 minutes.
- Ensure that provisions have been made before the commencement of a project for prompt medical attention, including transportation, in the case of serious injury.
- Ensure adequate first aid supplies and equipment are readily available.
- Ensure that in areas where 911 is not available, the telephone numbers of the physicians, hospitals, or ambulances to be used shall be conspicuously posted.

2.1.3 Safety Manager

Safety Manager is responsible for thoroughly evaluate and, as necessary, revise our program, we ensure our program's effectiveness and prevent or eliminate any problems. Program evaluation is performed at least annually.

3.0 SAFETY

3.1 First-Aid Supplies

It is advisable for the employer to give a specific person the responsibility for choosing the types and amounts of first-aid supplies and for maintaining these supplies. The supplies must be adequate, should reflect the kinds of injuries that occur, and must be stored in an area where they are readily available for emergency access. An automated external defibrillator (AED) should be considered when selecting first-aid supplies and equipment.

A specific example of the minimal contents of a workplace first-aid kit is described in American National Standards Institute ANSI Z308.1 - 2003, Minimum Requirements for Workplace First Aid Kits. The kits described are suitable for small businesses. For large operations, employers should determine how many first-aid kits are needed, and if it is appropriate to augment the kits with additional first-aid equipment and supplies.

Employers who have unique or changing first-aid needs should consider upgrading their first-aid kits. The employer can use the OSHA 300 log, OSHA 301 reports or other records to identify the first-aid supply needs of their worksite.

3.2 Automated External Defibrillators

With recent advances in technology, automated external defibrillators (AEDs) are now widely available, safe, effective, portable, and easy to use. They provide the critical and necessary treatment for *Sudden Cardiac Arrest* (SCA) caused by ventricular fibrillation, the uncoordinated beating of the heart leading to collapse and death. Using AEDs as soon as possible after sudden cardiac arrest, within 3-4 minutes, can lead to a 60% survival rate. CPR is of value because it supports the circulation and ventilation of the victim until an electric shock delivered by an AED can restore the fibrillating heart to normal.

All worksites are potential candidates for AED programs because of the possibility of SCA and the need for timely defibrillation. Each workplace should assess its requirements for an AED program as part of its first-aid response. Some consideration should be taken into account when setting up a worksite AED program:

- Physician oversight
- Compliance with local state and federal regulations
- Coordination with local Emergency Medical Services
- A Quality Assurance program, and
- A Periodic Review

4.0 TRAINING

4.1 First-Aid Courses

Training for first aid is offered by the American Heart Association, the American Red Cross, the National

Safety Council, and other nationally recognized and private educational organizations. OSHA does not teach first-aid courses or certify first-aid training courses for instructors or trainees.

First-aid courses should be individualized to the needs of the workplace. Some of the noted program elements may be optional for a particular plant or facility. On the other hand, unique conditions at a specific worksite may necessitate the addition of customized elements to a first-aid training program.

4.2 Trainee Assessment

Assessment of successful completion of the first-aid training program should include instructor observation of acquired skills and written performance assessments.

4.3 Skills Update

First-aid responders may have long intervals between learning and using CPR and AED skills. Numerous studies have shown a retention rate of 6-12 months of these critical skills. The American Heart Association's Emergency Cardiovascular Care Committee encourages skills review and practice sessions at least every 6 months for CPR and AED skills. Instructor-led retraining for life- threatening emergencies should occur at least annually. Retraining for non-life-threatening response should occur periodically.

4.4 Program Update

The first-aid program should be reviewed periodically to determine if it continues to address the needs of the specific workplace. Training, supplies, equipment and first-aid policies should be added or modified to account for changes in workplace safety and health hazards, worksite locations and worker schedules since the last program review. The first-aid training program should be kept up-to- date with current first-aid techniques and knowledge. Outdated training and reference materials should be replaced or removed.

4.5 Elements of a First-Aid Training Program

4.5.1 Teaching Methods

Training programs should incorporate the following principles:

- Basing the curriculum on a consensus of scientific evidence where available
- Having trainees develop "hands-on" skills through the use of mannequins and partner practice
- Having appropriate first-aid supplies and equipment available
- Exposing trainees to acute injury and illness settings as well as to the appropriate response through the use of visual aids
- Including a course information resource for reference both during and after training.
- Allowing enough time for emphasis on commonly occurring situations
- Emphasizing skills training and confidence-building over classroom lectures
- Emphasizing quick response to first-aid situations

5.0 PROCEDURE

5.1 Planning

5.2 Preparing to Respond to a Health Emergency

The training program should include instruction or discussion in the following:

- Prevention as a strategy for reducing fatalities, illnesses, and injuries
- Interacting with the local EMS system
- Maintaining a current list of emergency telephone numbers (police, fire, ambulance, poison control) accessible by all employees
- Understanding the legal aspects of providing first-aid care, including Good Samaritan legislation, consent, abandonment, negligence, assault and battery, State laws and regulations
- Understanding the effects of stress, fear of infection, panic; how they interfere with performance and what to do to overcome these barriers
- Learning the importance of universal precautions and body substance isolation to provide protection from bloodborne pathogens and other potentially infectious materials.
- Understanding Personal Protective Equipment such as gloves, eye protection, masks, and respiratory barrier devices.
- Appropriate management and disposal of blood-contaminated sharps and surfaces, and awareness of OSHA's Bloodborne Pathogens standard.

5.3 Medical Response

All minor first aid is to be self-rendered. Because of the risks presented by certain bloodborne pathogens, no one is allowed to tend the minor injuries of another.

In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, which is available for the treatment of injured employees, a person who has a valid certificate in first-aid shall be available at the worksite to render first aid. A valid certificate in first-aid training must be obtained from the U.S. Bureau of Mines, the American Red Cross or equivalent training that can be verified by documentary evidence.

Employees authorized to render first aid will always observe universal precautions. (Universal Precautions means that the aid giver treats all bodily fluids as if they were contaminated).

If 911 is not available, refer to the list of posted phone numbers for prearranged medical response providers. All Robinson Brothers Construction, Inc. authorized first responders shall have a cell phone as a means of communications; otherwise, handheld radios or telephones should be used as a means of communication.

5.4 Assessing the Scene and the Victim(s)

- The training program should include instruction in the following:
- Assessing the scene for safety, number of injured, and nature of the event,
- Assessing the toxic potential of the environment and the need for respiratory protection,

- Establishing the presence of a confined space and the need for respiratory protection and specialized training to perform a rescue,
- Prioritizing care when there are several injured,
- Assessing each victim for responsiveness, airway patency, (blockage), breathing, circulation, and medical alert tags,
- Taking a victim's history at the scene, including determining the mechanism of injury,
- Performing a logical head-to-toe check for injuries, stressing the need for continuous monitoring of the victim,
- Emphasizing early activation of EMS,
- Indications for and methods of safely moving and rescuing victims, repositioning ill/injured victims to prevent further injury.

5.5 Responding to Life-Threatening Emergencies

The training program should be designed or adapted for the specific worksite and may include first-aid instruction in the following:

- Establishing responsiveness,
- Establishing and maintaining an open and clear airway,
- Performing rescue breathing,
- Treating airway obstruction in a conscious victim,
- Performing CPR,
- Using an AED,
- Recognizing the signs and symptoms of shock and providing first aid for shock due to illness or injury,
- Assessing and treating a victim who has an unexplained change in level of consciousness or sudden illness,
- Utilizing direct pressure in the process of controlling bleeding.

5.6 Poisoning

5.6.1 Ingested Poisons:

Alkali, Acid, and Systemic poisons. Inhaled poisons:

- Carbon monoxide,
- Hydrogen sulfide,
- Smoke, and other chemical fumes,

- Vapors, and gases.

Assessing a toxic potential that may affect the environment and the need for respirators:

- Knowledge of the chemicals at the worksite and of first aid and treatment for inhalation or ingestion.
- Effects of alcohol and illicit drugs so that the first-aid provider can recognize the physiologic and behavioral effects of these substances.
- Recognizing asphyxiation and the danger of entering a confined space without appropriate respiratory protection.
- Additional training is required if first-aid personnel will assist in the rescue from the confined space.

5.7 Responding to Medical Emergencies

- Chest pain
- Stroke
- Breathing problems
- Anaphylactic reaction
- Hypoglycemia in people with diabetes who is taking insulin
- Seizures
- Pregnancy complications
- Abdominal injury
- Reduced level of consciousness
- Impaled object

5.8 Responding to Non-Life-Threatening Emergencies

The training program should be designed for the specific worksite and include first-aid instruction for the management of the following:

a. Wounds

- Assessment and first aid for wounds including abrasions, cuts, lacerations, punctures, avulsions, amputations and crush injuries
- Principles of wound care, including infection precautions
- Principles of body substance isolation, universal precautions and use of personal protective equipment

b. Burns

- Assessing the severity of a burn
- Recognizing whether a burn is thermal, electrical, or chemical and the appropriate first aid

- Reviewing corrosive chemicals at a specific worksite, along with appropriate first aid

c. Temperature Extremes

- Exposure to cold, including frostbite and hypothermia
- Exposure to heat, including heat cramps, heat exhaustion, and heat stroke

d. Musculoskeletal Injuries

- Fractures
- Sprains, strains, contusions and cramps
- Head, neck, back and spinal injuries
- Appropriate handling of amputated body parts

e. Eye Injuries

- First aid for eye injuries
- First aid for chemical burns

f. Mouth and Teeth Injuries

- Oral injuries
- lip and tongue injuries
- broken and missing teeth

The importance of preventing aspiration of blood and/or teeth.

g. Bites and Stings

- Human and animal bites
- Bites and stings from insects, instruction in first-aid treatment of anaphylactic shock

5.9 Supplies and Equipment

First aid supplies shall be easily accessible when required. Always follow the manufacturer's instructions when using the materials in the first aid kit.

All Robinson Brothers Construction, Inc. first aid kits contain appropriate items determined to be appropriate to the environment in which they are used and if on a construction site are stored in a weatherproof container with individual contents sealed from the manufacturer for each type of item.

Robinson Brothers Construction, Inc. is responsible for ensuring the availability of adequate first aid supplies and to periodically inspect or reassess for the availability of supplies and to adjust its inventories. First Aid kits are to be inspected:

- On the first working day of each week to verify that they are fully stocked and that no expiration dates have been exceeded, and
- Before being sent out to each job, and

- Replace any items that have exceeded their expiration dates or that have been depleted.

Where the eyes or body of any person may be exposed to injurious corrosive materials, a safety shower and/or eyewash (suitable facilities) or other suitable facilities shall be provided within the work area. Ensure expiration dates are checked and water used in storage devices is sanitized.

An assessment of the material or materials used shall be performed to determine the type flushing/drenching equipment required. At client job sites, portable or temporary stations must be established before the use of corrosive materials.

5.10 Transportation

Based on the first responder's assessment of the injuries involved, decide whether the injured requires being taken directly to a hospital's emergency room, occupational medicine provider or administer first aid on location.

Examples of serious injuries that result in the injured being transported to a medical provider are those resulting in severe blood loss, possible permanent disfigurement, head trauma, spinal injuries, internal injuries and loss of consciousness. Keep in mind that the needs and well-being of the injured are the first priority.

Proper equipment for prompt transportation of the injured person to a physician or hospital or a communication system for contacting necessary ambulance service shall be provided.

Choices to consider include:

private automobile, helicopter, crew boat, EMS vehicles including medivac helicopters, or any other transportation that can provide safe transportation to the hospital or doctors office in order to provide medical attention to the injured in the quickest manner without any additional complications or injuries to the injured employee.

Transportation needs must be pre-planned and coordinated with the transportation provider prior to an incident requiring such service.

5.11 Incident Reporting

After the immediate needs of an injury or illness emergency have been met, we require our employees to report the event to their supervisor. Minor injuries, like a small bruise, do not need to be reported. However, those injuries and illnesses involving professional treatment, time away from work, or a near miss of a more serious accident, must be reported to an employee's supervisor. Even injuries that do not become apparent until after the cause must be reported. For example, back pain that develops over a period of time must be reported.

6.0 RECORDKEEPING

The Safety Manager is responsible for maintaining the training records and documentation relating to first aid, injuries, illnesses, and accidents.

7.0 REFERENCES

1.	**Documents & External References** https://www.osha.gov/Publications/OSHA3317first-aid.pdf, www.houstoncontrols.com/.../First%20Aid%20CPR%20Program.doc,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this Powered Industrial Truck Program is to protect the health and safety of all employees assigned to operate powered industrial trucks and to comply with the requirements of *29 CFR 1910.178 (Powered Industrial Trucks).*

1.1 Scope

This program is intended to assist Robinson Brothers Construction, Inc.'s employee's and contractor's in the protection of their environment when working with Forklift and Industrial Trucks**.** Also, the information in this program shall be used to train prospective industrial truck operators and provide the basis for refresher and annual retraining. *OSHA reference for Powered Industrial Trucks is 1910.178.*

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Backrest	Supports the load when tipped back and adds stability.
Counterbalance Forklifts	Designed for both indoor and outdoor use, counterbalance truck wheels as their center of gravity and can be powered by battery, propane, gasoline or diesel fuel.
Full-tapered Forks	Forks that gradually increase in thickness from the tip of the fork all the way back to the fork's heel (rear). Full-tapered forks are used to lift lighter loads.
Load Center	The distance from the heels of the forks to the load's center of gravity.
Mast	The mechanism on the truck that raises and lowers the load. The mast is made up of a set of tracks that house bearings and chains.
Material Handling	Any activity that involves picking up and moving materials, parts and/or finished products.
Powered Industrial Truck	An industrial vehicle used to carry, push, pull, lift or stack material that is powered by an electric motor or an internal combustion engine. Included are vehicles that are commonly referred to as forklift trucks, rider trucks, motorized or powered hand trucks, pallet trucks and tugs. Not included are compressed air or nonflammable compressed gas-operated industrial trucks, farm vehicles or vehicles intended primarily for earth moving or over-the-road hauling.
Overhead Guard	A guard over the operator's head that protects the operator from falling debris. Note: The overhead guard is not designed to withstand the full impact of falling objects.
Rated Capacity	The maximum weight that the truck is designed to lift as determined by the manufacture. To lift the maximum rated capacity, the load must be as close as possible to the drive wheels. The rated capacity of a truck can be found on the Identification Plate on the vehicle and/or in the manufacture's operator manual.
Side Stability	Refers to the truck's ability to resist tipping sideways under various loaded and unloaded conditions.

2.1 Responsibilities

2.1.1 Management

- Provide adequate training in safe operation of all equipment used to move or access materials,
- Provide equipment that is safe to operate,
- Implement an "Out of Service" program for damaged equipment,
- Not allow modification to equipment except those authorized in writing by the equipment manufacturer, and
- Establish safe operating rules and procedures.

2.1.2 Supervisors

- Monitor safe operations of material handling equipment,
- Ensure all equipment is safety checked daily, and
- Tag "Out of Service" any damaged equipment.

2.1.3 Employees

- Operate only that equipment for which they have been specifically trained and authorized,
- Conduct required daily pre-use inspections,
- Report any equipment damage of missing safety gear, and

  Follow all safety rules and operating procedures.

3.0 SAFETY

3.1 Operating Hazards

- Falling loads,
- Overloading of equipment,
- Impact with equipment,
- Piercing of containers,
- Loading dock roll off,
- Chemical contact - battery acid, and
- Fires during refueling.

3.1.1 Hazard Controls

- Control of equipment keys,
- Authorized fueling & recharge areas,
- Proper palletizing of material,
- Marked travel lanes,
- Equipment warning lights,

- Seat belts, and
- Mounted fire extinguishers.

4.0 TRAINING

4.1 Training for Powered Industrial Truck (PIT) Operators

Training for Powered Industrial Truck (PIT) Operators shall be conducted by an experienced Certified Operator, selected by Management. All operational training shall be conducted under close supervision. All training and evaluation must be completed before an operator is permitted to use a Powered Industrial Truck (forklift, etc.) without continual & close supervision. Training consists of:

a. Trainees may operate a powered industrial truck only:

- Under the direct supervision of persons, who is a *Qualified Instructor* selected by management, who have the knowledge, training, and experience to train operators and evaluate their competence, and
- Where such operation does not endanger the trainee or other employees.

4.1.1 Training Content

Training consists of a combination of formal instruction, practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.

b. Initial Training:

Powered industrial truck operators shall receive initial training in the following topics:

c. Powered Industrial Truck regulatory-mandated training topics:

1. Operating instructions, warnings, and precautions for the types of truck the certified operator will be authorized to operate,
2. The differences between the truck and the automobile,
3. Truck controls and instrumentation:
   - where they are located, what they do, and how they work,
4. Engine or motor operation,
5. Steering and maneuvering,
6. Visibility (including restrictions due to loading),
7. Fork and attachment adaptation, operation, and use limitations,
8. Vehicle capacity,
9. Vehicle stability,
10. Any vehicle inspection and maintenance that the operator will be required to perform,
11. Refueling and/or charging and recharging of batteries, and
12. Operating limitations.

Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

5.0 PROCEDURE

5.1 Pre-Qualification

All candidates for Powered Industrial Truck (PIT) operators must meet the following basic requirements prior to starting initial or annual refresher training:

- Must have no adverse vision problems that cannot be corrected by glasses or contacts,
- No adverse hearing loss that cannot be corrected with hearing aids,
- No physical impairments that would impair safe operation of the PIT,
- No neurological disorders that affect balance or consciousness, and
- Not taking any medication that affects perception, vision, or physical abilities.

5.2 Workplace-Related Topics

- Surface conditions where the vehicle will be operated,
- Composition of loads to be carried and load stability,
- Load manipulation, stacking, and unstacking,
- Pedestrian traffic in areas where the vehicle will be operated,
- Narrow aisles and other restricted places where the vehicle will be operated,
- Hazardous (classified) locations where the vehicle will be operated,
- Ramps and other sloped surfaces that could affect the vehicle's stability,
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust, and
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

a. Refresher training and evaluation:

Refresher training, including an evaluation of the effectiveness of that training, shall be conducted to ensure that the operator has the knowledge and skills needed to be a certified operator to operate the powered industrial truck safely. Refresher training in relevant topics shall be provided to the operator when:

- The certified operator has been observed to operate the vehicle in an unsafe manner,
- The operator has been involved in an accident or near-miss incident,
- The certified operator has received an evaluation that reveals that the operator is not operating the truck safely,
- The certified operator is assigned to drive a different type of truck,
- A condition in the workplace changes in a manner that could affect safe operation of the truck, and
- An evaluation will be conducted of each powered industrial truck operator's performance. Once every 3 years at a minimum.

5.3 Program Review

The (position designated) will review and evaluate the effectiveness of this program when any of the following occurs:

- On an annual basis
- When changes occur to the OSHA Standard that require a revision to this program.
- When changes occur to related procedures that require a revision.
- When facility operational changes occur that require a revision.
- When there is an accident or near miss that relates to this area of safety.

5.4 Safe Operating Procedures (SOP) and Rules

- Only authorized and trained personnel will operate PITs.
- All PITs will be equipped with a headache rack, fire extinguisher, rotating beacon, back-up alarm and seat belts. Seat belts will be worn at all times by the Operator.
- The operator will perform daily pre- and post-trip inspections.
- Any safety defects (such as hydraulic fluid leaks; defective brakes, steering, lights, or horn; and/or missing fire extinguisher, lights, seat belt, or back-up alarm) will be reported for immediate repair or have the PIT taken "Out of Service".
- Operators will follow the proper recharging or refueling safety procedures.
- Loads will be tilted back and carried no more than 6 inches from the ground. Loads that restrict the operator's vision will be transported backwards.
- PITs will travel no faster than 5 mph or faster than a normal walk.
- Hard hats will be worn by PIT Operators in high lift areas.
- Operator will sound horn and use extreme caution when meeting pedestrians, making turns and cornering.
- Passengers may not ride on any portion of a PIT. Only the operator will ride PITs. "NO PASSENGERS" decals will be affixed on all PITs.
- If PITs are used as a man lift, an appropriate man lift platform (cage with standard rails and toe-boards) will be used.
- Aisle will be maintained free from obstructions, marked and wide enough (six-foot minimum) for vehicle operation.
- Lift capacity will be marked on all PITs. Operator will assure load does not exceed rated weight limits.
- When un-attended, PITs will be turned off, forks lowered to the ground and parking brake applied.
- All PITs (with exception of pallet jacks) will be equipped with a multi-purpose dry chemical fire extinguisher. (Minimum rating; 2A:10B:C).
- Operators are instructed to report all accidents, regardless of fault and severity, to Management. Management will conduct an accident investigation.
- When loading rail cars and trailers, dock plates will be used. Operators will assure dock plates are in good condition and will store on edge when not in use.

- Rail cars and trailers will be parked squarely to the loading area and have wheels chocked in place. Operators will follow established Docking/Un-Docking Procedures.

5.5 Changing and Charging Storage Batteries

- Battery charging installations shall be located in areas designated for that purpose.
- Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.
- Reinstalled batteries shall be properly positioned and secured in the truck.
- A carboy tilter or siphon shall be provided for handling electrolyte.
- When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.
- Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.
- Smoking is prohibited in the charging area.
- Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- Tools and other metallic objects shall be kept away from the top of uncovered batteries.

5.6 Trucks and Railroad Cars

- The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.
- The brakes of highway trucks shall be set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.
- Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.
- Fixed jacks may be necessary to support a semitrailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.
- Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.

5.7 Operations

- If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition.
- Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.
- No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

- Unauthorized personnel shall not be permitted to ride on powered industrial trucks.
- Arms or Legs shall not be placed between the uprights of the mast or outside the running lines of the truck.
- When a powered industrial truck is left unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels shall be blocked if the truck is parked on an incline.
- A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.
- There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.
- An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.
- A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
- Trucks shall not be parked so as to block fire aisles, access to stairways, or fire equipment.

5.8 Traveling

- All traffic regulations shall be observed, including authorized speed limits. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.
- The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.
- Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations shall not be passed.
- The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
- Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.
- The driver shall be required to look in the direction of, and keep a clear view of the path of travel.
- Grades shall be ascended or descended slowly. When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade. On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.
- Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.
- Stunt driving and horseplay shall not be permitted.
- The driver shall be required to slow down for wet and slippery floors.
- Dockboard or bridge plates, shall be properly secured before they are driven over. Dockboard or bridge plates shall be driven over carefully and slowly and their rated capacity never exceeded.

- Running over loose objects on the roadway surface shall be avoided.
- While negotiating turns, speed shall be reduced to a safe level by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate.

5.9 Loading

- Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.
- Only loads within the rated capacity of the truck shall be handled.
- The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.
- Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.
- A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.
- Extreme care shall be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load.
- An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

5.10 Fueling Safety

- Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.
- Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.
- No truck shall be operated with a leak in the fuel system until the leak has been corrected.
- Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

5.11 Maintenance of Powered Industrial Trucks

- Any power-operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.
- Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.
- Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.
- All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.
- Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.

- Additional counter-weighting of fork trucks shall not be done unless approved by the truck manufacturer.
- Industrial trucks shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily. Where industrial trucks are used on a round-the-clock basis, they shall be examined prior to use each shift. Defects when found shall be immediately reported and corrected.
- When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
- Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 deg. F.) solvents shall not be used. High flash point (at or above 100 deg. F.) solvents may be used.

I. Safe Operation Procedure for Charging LPG Tank

1. No Smoking.
2. Move LPG PIT outside for refueling.
3. Turn off PIT.
4. LPG tanks will be removed in the following order:
   - shut off service valve
   - disconnect tank from hose
   - unbuckle and remove tank from bracket
5. LPG tanks will be replaced in to following order:
   - place tank in bracket and re-buckle
   - reconnect hose to tank and tighten firmly
   - open valve slowly and assure proper seal

NOTE: Federal Law Prohibits dispensing an improper fuel type into any Vehicle or into a non-approved fuel container.

a. <u>In Case of LPG Leaks or Tank Rupture</u>

1. DO NOT start or move the PIT.
2. If fuel hose is leaking, Close valve immediately and place PIT "Out of Service" until repaired.
3. If tank ruptures, warn other, immediately leave the area (at least 50 feet) and notify Management. Do not re-enter the area until cleared by Management.

i. Powered Industrial Truck Pre-Use Checklist

A check of the following items (as applicable) is to be conducted by the operator prior to use each shift:

- Lights
- Horn
- Brakes
- Leaks

- Warning Beacon
- Backup Warning Alarm
- Fire Extinguisher

If any deficiencies are noted, the unit is to be placed OUT OF SERVICE until the problem has been corrected. Additionally, it is the operator's responsibility to notify the immediate supervisor and fill out a maintenance request.

6.0 RECORDKEEPING

6.1.1 EH&S Department

- EH&S maintains a training and licensure file of all powered industrial truck operators.
- These records and all past licensure shall be available anytime by the department safety coordinator, supervisor, or certified operator.
- All departments that have trained powered industrial truck operators shall keep a current copy of licensure on file for (up to three years).
- The EH&S Trainer retains all training tests, forms, and sign-in sheets for record keeping purposes. These records will reside with the "Fork-truck Safety Program Manager" files.
- Written materials required to be retained shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

6.1.2 Departments that own/use Industrial Lift Trucks

Shall keep a current copy of the Forklift and Industrial Work Trucks Safety Program.

7.0 REFERENCES

1.	**Documents & External References** https://www.patriotinsuranceco.com/PublicDocs/pdf/PIC/SafetyServices/Forklift.pdf, http://ehs.berkeley.edu/sites/default/files/lines-of-services/workplace-safety/forkliftprogram.pdf,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this waste management strategy was developed to provide guidance and requirements necessary for efficient, effective and compliant waste management during construction and operations.

1.1 Scope

This procedure applies to all Robinson Brothers Construction, Inc. employees and subcontractors. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
General waste	Is any waste that is not classified as clinical or related waste. It includes paper, plastic, glass, liquids and organics.
Hazardous waste	Includes clinical waste and *related waste.*
Waste management	Is the collection, transport, processing, recycling or disposal, and monitoring of waste materials. The term usually relates to materials produced by human activity, and it is generally undertaken to reduce the effects of waste on health, the environment or aesthetics and to recover resources through recycling.

2.1 Responsibilities

2.1.1 Management

- Provide employee training in support of the General Waste Program.
- Develop procedures and facilities for collection, labeling, and storage.
- Audit the program to ensure compliance.
- Contract with an Authorized Transporter for removal and disposal of Hazardous Waste.
- Supervisors shall ensure all General Waste in their areas are properly segregated and collected.

2.1.2 Supervisors

Shall ensure all General Waste in their areas are properly segregated and collected.

2.1.3 Employees

- Shall follow the requirements of this program.

- Ensure project wastes, trash, and/or scrap materials will be taken into consideration before work begins.

3.0 SAFETY

3.1 Hazardous Waste Management

Hazardous wastes should always be segregated from non- hazardous wastes. If the generation of hazardous waste can not be prevented through the implementation of the above general waste management practices, its management should focus on the prevention of harm to health, safety, and the environment, according to the following additional principles:

- Understanding potential impacts and risks associated with the management of any generated hazardous waste during its complete life cycle.
- Ensuring that contractors handling, treating, and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the waste being handled ensuring compliance with applicable local and international regulations.

4.0 TRAINING

Employees shall be instructed on the proper disposal method of wastes. Examples include:

- The proper handling, organization, and storage of waste and scrap materials to minimize potential impact to the environment
- General instruction on disposal of non-hazardous wastes, trash or scrap materials
- Minimization methods to reduce waste
- Recycling methods
- If wastes generated are hazardous, then employees shall be trained to ensure proper disposal and compliance with regulations.

5.0 PROCEDURE

5.1 General Waste Management

The following guidance applies to the management of non- hazardous and hazardous waste. The additional guidance specifically applicable to hazardous wastes is presented below. Waste management should be addressed through a *Waste Management System* that addresses issues linked to waste minimization, generation, transport, disposal, and monitoring.

5.2 Waste Management Planning

Facilities that generate waste should characterize their waste according to composition, source, types of wastes produced, generation rates, or according to local regulatory requirements. Effective planning and implementation of waste management strategies should include:

- Review of new waste sources during planning, siting, and design activities, including during equipment modifications and process alterations, to identify expected waste generation, pollution prevention opportunities, and necessary treatment, storage, and disposal infrastructure.

- A collection of data and information about the process and waste streams in existing facilities, including characterization of waste streams by type, quantities, and potential use/disposition.
- Establishment of priorities based on a risk analysis that takes into account the potential EH&S risks during the waste cycle and the availability of infrastructure to manage the waste in an environmentally sound manner.
- Definition of opportunities for source reduction, as well as reuse and recycling.

5.3 Waste Prevention

Processes should be designed and operated to prevent, or minimize, the quantities of wastes generated and hazards associated with the wastes generated in accordance with the following strategy:

- Substituting raw materials or inputs with less hazardous or toxic materials, or with those where processing generates lower waste volumes
- Applying manufacturing process that converts materials efficiently, providing higher product output yields, including modification of design of the production process, operating conditions, and process controls
- Instituting good housekeeping and operating practices, including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off-specification, contaminated, damaged, or excess to plant needs
- Instituting procurement measures that recognize opportunities to return usable materials such as containers and which prevents the over ordering of materials
- Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste to be managed.

5.4 Recycling and Reuse

In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through the implementation of recycling plans, which should consider the following elements:

- Evaluation of waste production processes and identification of potentially recyclable materials Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site.
- Investigation of external markets for recycling by other industrial processing operations located in the neighborhood or region of the facility (e.g., waste exchange).
- Establishing recycling objectives and formal tracking of waste generation and recycling rates.
- Providing training and incentives to employees in order to meet objectives.

5.4.1 Treatment and Disposal

If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste materials should be treated and disposed of, and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches should be consistent with the characteristics of the waste and local regulations, and may include one or more of the following:

- On-site or off-site biological, chemical, or physical treatment of the waste material to render it non-hazardous prior to final disposal.
- Treatment or disposal at permitted facilities specially designed to receive the waste. Examples include:
  - ❖ Composting operations for organic non-hazardous wastes,
  - ❖ Properly designed, permitted and operated landfills, or incinerators designed for the respective type of waste, or
  - ❖ Other methods are known to be effective in the safe, final disposal of waste materials such as bioremediation.

5.5 Waste Storage

Hazardous waste should be stored so as to prevent or control accidental releases to air, soil, and water resources in area location where:

- Waste is stored in a manner that prevents the commingling or contact between incompatible wastes and allows for inspection of containers to monitor leaks or spills. Examples include sufficient space between incompatibles or physical separation such as walls or containment curbs.
- Store in closed containers away from direct sunlight, the wind, and rain.
- Secondary containment systems should be constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment.
- Secondary containment is included wherever liquid wastes are stored in volumes greater than 220 liters.
- The available volume of secondary containment should be at least 110 percent of the largest storage container, or 25 percent of the total storage capacity (whichever is greater), in that specific location.
- Provide adequate ventilation where volatile wastes are stored.
- Hazardous waste storage activities should also be subject to special management actions, conducted by employees who have received specific training in handling and storage of hazardous wastes:
  - ❖ Provision of readily available information on chemical compatibility to employees, including labeling each container to identify its contents.
  - ❖ Limiting access to hazardous waste storage areas to employees who have received proper training
  - ❖ Clearly identifying (label) and demarcating the area, including documentation of its location on a facility map or site plan.
  - ❖ Conducting periodic inspections of waste storage areas and documenting the findings.
  - ❖ Preparing and implementing spill response and emergency plans to address their accidental release.
  - ❖ Avoiding underground storage tanks and underground piping of hazardous waste.

5.6 Transportation

On-site and Off-site transportation of waste should be conducted so as to prevent or minimize spills, releases, and exposures to employees and the public. All waste containers designated for off-site shipment

should be secured and labeled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the site, and be accompanied by a shipping paper (i.e., manifest) that describes the load and its associated hazards,

5.6.1 Treatment and Disposal

In addition to the recommendations for treatment and disposal applicable to general wastes, the following issues specific to hazardous wastes should be considered:

a. Commercial or Government Waste Contractors

In the absence of qualified commercial or government-owned waste vendors (taking into consideration proximity and transportation requirements), facilities generating waste should consider using contractor that:

- Have the technical capability to manage the waste in a manner that reduces immediate and future impact to the environment.
- Have all required permits, certifications, and approvals, of applicable government authorities.
- Have been secured through the use of formal procurement agreements.

In the absence of qualified commercial or government-owned waste disposal operators (taking into consideration proximity and transportation requirements), project sponsors should consider using:

- Installing on-site waste treatment or recycling processes.
- As a final option, constructing facilities that will provide for the environmental sound long-term storage of wastes on-site or at an appropriate alternative location up until external commercial options become available.

5.7 Small Quantities of Hazardous Waste

Hazardous waste materials are frequently generated in small quantities by many projects through a variety of activities such as equipment and building maintenance activities. Examples of these types of wastes include:

- Spent solvents and oily rags, empty paint cans, chemical containers; used lubricating oil; used batteries (such as nickel-cadmium or lead acid), and
- Lighting equipment, such as lamps or lamp ballasts.
- These wastes should be managed following the guidance provided in the above sections.

5.8 Monitoring

Monitoring activities associated with the management of hazardous and non-hazardous waste should include:

- Regular visual inspection of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labeled and stored.
- When significant quantities of hazardous wastes are generated and stored on site, monitoring activities should include:
  - ❖ Inspection of vessels for leaks, drips or other indications of loss.

- ❖ Identification of cracks, corrosion, or damage to tanks, protective equipment, or floors.
- ❖ Verification of locks, emergency valves, and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied).
- ❖ Checking the operability of emergency systems.
- ❖ Documenting results of testing for integrity, emissions, or monitoring stations (air, soil vapor, or groundwater).
- ❖ Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage.

5.9 Audits

Regular audits of waste segregation and collection practices:

- Tracking of waste generation trends by type and amount of waste generated, preferably by facility departments.
- Characterizing waste at the beginning of generation of a new waste stream, and periodically documenting the characteristics and proper management of the waste, especially hazardous wastes.
- Keeping manifests or other records that document the amount of waste generated and its destination
- Periodic auditing of third party treatment, and disposal services including re-use and recycling facilities when.
- significant quantities of hazardous wastes are managed by third parties.
- Whenever possible, audits should include site visits to the treatment storage and disposal location.
- Regular monitoring of groundwater quality in cases of Hazardous Waste on-site storage and/or pre-treatment and disposal.

6.0 RECORDKEEPING

Monitoring records for hazardous waste collected, stored, or shipped should include:

- Name and identification number of the material(s) composing the hazardous waste
- Physical state (i.e., solid, liquid, gaseous or a combination of one, or more, of these)
- Quantity (e.g., kilograms or liters, number of containers)
- Waste shipment tracking documentation to include, quantity and type, date dispatched, date transported and date received, record of the originator, the receiver, and the transporter
- Method and date of storing, repacking, treating, or disposing at the facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste.
- Documents generated by monitoring, and audits.
- Location of each hazardous waste within the facility, and the quantity at each location.

7.0 REFERENCES

1.	**Documents & External References** file:///F:/USRAVs%20Working/2nd%20Set/New%20Set/32.%20General%20Waste%20Management/Research/Waste+Management-good.pdf,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to provide establish requirements for the safe operation of hand and power tools and other portable tools, including proper guarding.

1.1 Scope

All hand and power tools shall be maintained in a safe condition. This program applies to all Robinson Brothers Construction, Inc.s' employees who use hand and power tools, while engaged in work at Robinson Brothers Construction, Inc.s' facilities and/or facilities operated by others.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Airless spray	Airless spray is a method of atomizing paint without the use of compressed air. The paint is pumped under high pressure through a supply line to an airless gun.
Safety guard	Safety guard. A safety guard is an enclosure designed to restrain the pieces of the grinding wheel and furnish all possible protection in the event that the wheel is broken in operation.
Portable grinding	A grinding operation where the grinding machine is designed to be hand held and may be easily moved from one location to another
Jack	A jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force. **NOTE:** Jacks may be of the following types: Lever and ratchet, screw and hydraulic.
Rating	The rating of a jack is the maximum working load for which it is designed to lift safely that load throughout its specified amount of travel. **NOTE:** To raise the rated load of a jack, the point of application of the load, the applied force, and the length of lever arm should be those designated by the manufacturer for the particular jack considered.

2.1 Responsibilities

Any tool which is not in compliance with any applicable requirement of this plan is prohibited and shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

2.2 Managers and Supervisors

- Ensure that all employees using portable tools have been trained and fully understand the operations and maintenance procedures of such tools, including their proper use.
- Provide and trained employees with all additional PPE that may be needed for the safe operation of portable tools

2.3 Employees

- Shall ensure they have and properly use the correct tool for each task.
- Shall follow manufactures safety and operating instructions before using

3.0 SAFETY

3.1 Before Use:

- Use the correct tool for the task. Using the wrong tool requires users to expend much more uncontrolled energy and also damages the tool for safe use in the future.
- Do not wear clothing that has strings or loose ends that may get caught in the machinery.
- Wear appropriate personal protective equipment (e.g., safety glasses with side shields, respiratory protection, face shields, hearing protection).
- Check that power tools are properly grounded or double-insulated. NEVER remove the ground prong or use a two-prong adapter.
- Keep all bystanders at a safe distance. Only operators need to be in the area where tools are being used.
- Ensure all guards and shields are in place before turning on equipment.
- Make sure all cords/hoses are away from heat, oil, or sharp edges.
- Secure the work with clamps or a vice to keep your hands free and the material in place

3.2 After Use:

- Never disconnect power tools from the electrical outlet by pulling on the power cord.
- Keep tools in good condition. Refer to owner's manual for proper maintenance.
- Unplug power tools before changing blades or servicing the equipment.
- Safely store tools when not in use. Lock out power tools to prevent unauthorized use.
- Remove damaged tools from service.

4.0 TRAINING

Employees should be trained in the proper use of all tools. Workers should be able to recognize the hazards associated with the different types of tools and the safety precautions necessary:

- Power tools are to be operated only by competent persons who have been trained in their proper use of tools
- All employees using portable tools shall be trained and fully understand the operations, inspection, and maintenance procedures of such tools, including their proper use.

All employees shall be trained to use all additional PPE that may be needed for the safe operation of portable tools.

5.0 PROCEDURE

Fall protection is required whenever employees are potentially exposed to falls from height of six feet or greater to lower levels. This includes working near and around excavations. Use of guard rails, safety net, or personal fall arrest systems should be used when the standard methods of protection are not feasible or a greater hazard would be created.

5.1 General Requirements

All tools, regardless of ownership, shall be of an approved type and maintained in good condition:

- Tools are subject to inspection at any time.
- All employees have the authority and responsibility to condemn unsafe tools, regardless of ownership. Unsafe tools shall be tagged with a "DO NOT USE OR OPERATE" tag to prevent their use.
- Power tools should be inspected before each use. If there are any defects, such as insulation missing from the cord or a piece of the protective shell broken, the tool must be taken out of service until repaired.
- Employees shall always use the proper tool for the job to be performed.
- Hammers with metal handles, screwdrivers with metal continuing through the handle, and metallic measuring tapes shall not be used on or near energized electrical circuit or equipment.
- Tools shall not be thrown from place to place or from person to person.
- Impact tools such as chisels, punches, and drift pins that become swollen or cracked shall be dressed, repaired, or replaced before further use.
- The insulation on hand tools shall not be utilized to protect users from high voltage shock (except approved live line tools).
- Chisels, drills, punches, ground rods, and pipes shall be held with suitable holders or tongs (not with the hands) while being struck by another employee.
- Tools that must be raised or lowered from one elevation shall never be placed unsecured on elevated places.
- Wooden handles that are loose, cracked, or splintered shall be replaced. The handle shall not be taped or lashed with wire.
- Shims shall not be used to make a wrench fit. Wrenches with sprung or damaged jaws shall not be used. Tools shall be used only for the purposes for which they have been approved.
- Tools with sharp edges shall be stored and handled so that they will not cause injury or damage and they shall not be carried in pockets unless suitable protectors are in use to protect the edge.
- Tools shall not be left lying around where they may cause a person to trip or stumble.
- Makeshift and substitute tools shall not be used.
- When working on or above open grating, a canvas or other suitable covering shall be used to cover the grating to prevent tools or parts from dropping to a lower level where others are present or the danger area shall be barricaded or guarded.

5.2 Portable Electric Tools

The non-current carrying metal parts of portable electric tools such as drills, saws, and grinders shall be effectively grounded when connected to a power source unless:

- The tool is an approved double insulated type, or
- The tool is connected to the power supply by means of an isolating transformer or other isolated power supply.
- All powered tools shall be examined prior to use to ensure general serviceability and the presence of all applicable safety devices.

- Powered tools shall be used only within their design and shall be operated in accordance with manufacturer's instructions. The use of electric cords for hoisting or lowering tools shall not be permitted.
- All tools shall be kept in good repair and shall be disconnected from the power source while repairs or adjustments are being made.

a. Electrical tools shall not be used where there is hazard of:

- Flammable vapor
- Gases, or
- Dusts without a valid hot work permit

Ground fault circuit interrupters or use of an *Assured Grounding Program* shall be used with portable electric tools. This does not apply to equipment run off of portable or truck mounted generators at 5 kw or less that are isolated from ground or to equipment ran directly off of secondaries.

b. Pneumatic Tools:

- Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.
- Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.
- All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 p.s.i. pressure at the tool shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.
- Compressed air shall not be used for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment which meets the requirements of Subpart E of this part. The 30 p.s.i. requirement does not apply for concrete form, mill scale and similar cleaning purposes.
- The manufacturer's safe operating pressure for hoses, pipes, valves, filters, and other fittings shall not be exceeded,
- The use of hoses for hoisting or lowering tools shall not be permitted.
- All hoses exceeding 1/2-inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose failure.
- In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.
- "Abrasive blast cleaning nozzles." The blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use:

a. Couplings, Clips and Clamps:

- All couplings and clamps on pressurized air hose shall be bridged (pinned) with suitable fasteners.
- Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

- Only approved end fitting clamps shall be used, (screw type heater hose clamps are not acceptable), While blowing down hose, do not point it toward people.
- All pneumatically driven tools that are equipped with automatic fastener feed and operate at more than 100 p.s.i. of pressure at the tool such as nailers, staplers, and other similar equipment shall have a safety device on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

Note: Foot protection shall be worn while operating paving breakers, tampers, rotary drills, clay spades, and similar impactor type tools or at other times when instructed by supervision.

b. Airless spray guns:

Atomize airless spray guns that atomize fluids at pressures of 1,000 pounds or more per square inch (6,890 kPa) must have a safety device that is visible and manual that will prevent the pulling of its trigger until the safety device is manually released, additional methods:

- A diffuser nut (which will prevent high pressure),
- High velocity release (while the nozzle tip is removed), and
- A nozzle tip guard (which will prevent the tip from coming into contact with the operator), or other equivalent protection, shall be provided.

5.3 Powder Actuated Tools (Tools Actuated by an Explosive Charge)

Only those employees who have been certified in their use shall operate these tools. Explosive charges shall be carried and transported in approved containers. Operators and assistants using these tools shall be protected by means of eye, face, and hearing protection. See safety prevention practices below:

- Before using tools, the operator shall read and become familiar with the manufacturers operating guidelines and procedures.
- Tools shall be maintained in good condition and serviced regularly by qualified persons. The material upon which these tools are to be used shall be examined before work is started to determine its suitability and to eliminate the possibility of hazards to the operator and others.
- Prior to use, the operator shall ensure that the protective shield is properly attached to the tool.
- Before using a tool, the operator shall inspect it to determine to their satisfaction, that all moving parts operate freely, all guards and safety devices are in place, the barrel is free from obstructions, and that tool is clean.
- When a tool develops a defect during use, the operator shall immediately cease to use it, until it is properly repaired in accordance with the manufactures specifications.
- Tools shall not be loaded until just prior to the intended firing time, nor shall an unattended tool be left loaded. Empty tools are not to be pointed at any workmen.
- In case of a misfire, the operator shall hold the tool in the operating position for at least 30 seconds. He shall then try to operate the tool a second time. He shall wait another 30 seconds, holding the tool in the operating position; then they shall proceed to remove the explosive load in strict accordance with the manufacturer's instructions.
- A tool shall never be left unattended in a place where it would be available to unauthorized persons. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, surface hardened steel, glass block, live rock, face brick, or hollow tile.

- Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.
- Tools shall not be used in an explosive or flammable atmosphere.

5.4 Hydraulic Power Tools

The fluid used in hydraulic powered tools shall be fire resistant fluids approved under Schedule 30 of the U.S. Bureau of Mines, Department of the Interior, and shall retain its operating characteristics at the most extreme temperatures to which it will be exposed.

The manufacturer's safe operating pressures for hoses, valves, pipes, filters, and other fittings shall not be exceeded.

All hydraulic tools, which are used on or around energized lines or equipment, shall use non-conducting hoses having adequate strength for the normal operating pressures.

5.5 Hydraulic Jacks

A Hydraulic Jack is a device that uses force to lift heavy loads. The primary mechanism with which force is applied varies, depending on the specific type of jack, but is typically a screw thread or a hydraulic cylinder.

Hydraulic Jacks must have a stop indicator, never exceed the stop limit, and ensure that the manufacturer's load limit is permanently marked on the jack in a prominent place.

Never utilize a jack to support a lifted load. Once a load has been lifted, it must immediately be blocked up, place a block under the base of the jack if the foundation does not seem steady, place a block between the jack cap and load if it appears that the cap might slip. When setting up a jack ensure to follow the steps below:

- The base of the jack rests on a firm, level surface;
- The jack is correctly centered;
- The jack head bears against a level surface; and
- The lift force is applied evenly.

a. Loading and Marking:

- The operator shall make sure that the jack used has a rating sufficient to lift and sustain the load.
- The rated load shall be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

5.6 Operation and Maintenance

Proper maintenance of jacks is critical for safety:

- In the absence of a firm foundation, the base of the jack shall be blocked. If there is a possibility of slippage of the cap, a block shall be placed in between the cap and the load.
- The operator shall watch the stop indicator, which shall be kept clean, in order to determine the limit of travel. The indicated limit shall not be overrun.
- After the load, has been raised, it shall be cribbed, blocked, or otherwise secured at once.

- Hydraulic jacks exposed to freezing temperatures shall be supplied with adequate antifreeze liquid.
- All jacks shall be properly lubricated at regular intervals.
- Each jack shall be thoroughly inspected before each use. Jacks, which are in unsafe condition, shall be tagged accordingly, and shall not be used until repairs are made.
- Abrasive Blast Cleaning Nozzles The blast cleaning nozzles shall be equipped with an operating valve, which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

5.7 Fuel Powered Tools

- All fuel powered tools shall be stopped while being refuelled, serviced, or maintained, and fuel shall be transported, handled, and stored in accordance with the Flammable and Combustible Liquids Program.
- When fuel powered tools are used in enclosed spaces, the applicable requirements for concentrations of toxic gases and use of personal protective equipment, shall be adhered too.

5.8 Guarding Portable Tools

Guards shall be in place and operable at all times while the tool is in use. The guard may not be manipulated in such a way that will compromise its integrity or compromise the protection in which intended. Guarding shall meet the requirements set forth in ANSI B15.1.

5.9 Portable Circular Saws

- All portable, power driven circular saws having a blade diameter greater than 2 in. shall be equipped with guards above and below the base plate or shoe.
- The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts.
- The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.
- When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to covering position.
- All cracked saw blades shall be removed from service.

5.10 Switches and Controls

- All hand held powered tools, circular saws, drills, tappers, fastener drivers, horizontal or vertical angle grinders, etc., shall be with a constant pressure switch or control, and may have a lock on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
- All hand held powered circular saws having a blade diameter greater than 2 inches, electric, hydraulic or pneumatic chain saws, and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released.
- All hand-held gasoline powered chain saws shall be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.
- The operating control on hand-held power tools shall be so located as to minimize the possibility of its accidental operation, if such accidental operation would constitute a hazard to employees.

- Grounding of portable electric powered tools shall meet the electrical requirements that can be found in the Electrical Safety Program. All electric power tools shall be equipped with a three-prong plug.

5.11 Portable Abrasive Wheels

Portable abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments. Abrasive wheel tools must be equipped with guards that:

- cover the spindle end, nut, and flange projections;
- maintain proper alignment with the wheel; and
- do not exceed the strength of the fastenings.

a. Safety Guards Exceptions:

- Wheels used for internal work while within the work being ground.
- Mounted wheels used in portable operations 2 inches and smaller in diameter.
- Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.
- Guards shall be made of steel or other material with adequate strength.

b. Exception:

- Safety guards on all operations where the work provides a suitable measure of protection to the operator may be so constructed that the spindle end, nut and outer flange are exposed. Where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted.
- Exception: the spindle end, nut, and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels.

5.12 Mounting and Inspection of Abrasive Wheels

- Immediately before mounting, all wheels shall be closely inspected and a ring test performed, to make sure they have not been damaged in transit, storage, or otherwise.
- Ring test – “tap” wheels about 45 degrees each side of the vertical centreline and about 1 or 2 inches from the periphery; then rotate the wheel 45 degrees and repeat the test; a sound and undamaged wheel will give a clear metallic tone. If cracked, there will be a dead sound and not a clear "ring.”
- The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel.
- Grinding wheels shall fit freely on the spindle and remain free under all grinding conditions.
- A controlled clearance between the wheel hole and the machine spindle (or wheel sleeves or adaptors) is essential to avoid excessive pressure from mounting and spindle expansion.
- The machine spindle shall be made too nominal (standard) size plus zero minus .002 inch, and the wheel hole shall be made suitably oversize to assure safety clearance under the conditions of operating heat and pressure.
- All contact surfaces of wheels, blotters, and flanges shall be flat and free of foreign matter.

- When a bushing is used in the wheel hole it shall not exceed the width of the wheel and shall not contact the flanges.

5.13 Portable Grinders

Special "revolving cup guards" which mount behind the wheel and turn with it shall be used. They shall be made of steel or other material with adequate strength and shall enclose the wheel sides upward from the back for one third of the wheel thickness. It is necessary to maintain clearance between the wheel side and the guard. The clearance shall not exceed one sixteenth inch.

Vertical portable grinders, also known as right angle grinders, shall have a maximum exposure angle of 180 degrees and the guard shall be located between the operator and the wheel during use. Adjustment of the guard shall ensure that pieces of an accidentally broken wheel will be deflected away from the operator.

5.14 Other Portable Grinders

The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed 180 degrees and the top half of the wheel shall be enclosed at all times.

6.0 RECORDKEEPING

Training records shall include:

- Who was trained
- When and dates of training
- Signature of person providing training
- Date training was deemed adequate

Training records shall be retained and shall be readily available for authorized persons to review. The following information is maintained as a result of this process:

- The employer shall maintain all employee training records.
- The employer shall make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.
- The employer shall provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.

7.0 REFERENCES

1.	**Documents & External References** (Published in Title 29 Code of Federal Regulations (CFR), Part 1910, Subpart P), or for the construction industry, (Published in 29 CFR Part 1926, Subpart I), OSHA publication Hand & Power Tools 03080, OSHA Safety & Health Topics: Hand and Power Tools https://www.osha.gov/SLTC/handpowertools/index.html.

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendment

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: **Name & Title**

1.0 PURPOSE

To provide an effective, written hazard communication program in compliance with company State and Federal regulatory requirements. Hazard Communication applies to all chemicals and mixtures purchased, manufactured, used, and/or stored by the company to which employees, contractors, tenants or visitors may be exposed.

(Note: That Laboratories, as defined by OSHA regulations, are not covered under this program.)

1.1 Scope

This program applies to all Robinson Brothers Construction, Inc. employees, facilities, and job sites where workers may be exposed to hazardous chemicals. Work performed on client sites may be subject to the client's Hazard Communication Program. The client's program will govern such sites.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Article	A product whose use is dependent upon the product's size and shape and which does not constitute a hazard. (i.e. furniture, toys, packaging, etc.)
ACGIH	American Conference of Governmental Industrial Hygienists
SDS	Safety Data Sheets are reference documents that outline the product information, hazards and other required elements for hazardous chemicals or materials. These documents are produced by the manufacturer of the chemical or material and must be maintained at any workplace where they are used or stored.
Process Materials	Chemicals that are routinely used in a chemical process or as part of a mixture for a chemical process.

2.1 Responsibilities

2.1.1 Management

Perform a hazard determination. The company is required to determine the hazards of any products or chemicals they manufacture and/or sell. Such items require the company to produce and maintain date Safety Data Sheets (SDS) and provide these to suppliers and customers with initial shipment when changes occur, or upon request, an SDS must include:

- Identity of the product, as used on the label (its chemical or common name, and hazardous ingredients or hazardous components)
- Physical and chemical characteristics (i.e. vapor pressure, flash point, pH)

- Health Hazards (signs, symptoms or associated medical conditions)
- Primary routes of entry (inhalation, ingestion, absorption)
- OSHA, ACGIH or other exposure limits known
- Toxicological information, including carcinogenicity
- Safe handling precautions (hygiene practices, spill or leak clean-up, etc.)
- Control measures (PPE, ventilation, etc.)
- Emergency and First-aid procedures
- Date of last revision to all SDS
- Name address and telephone number of the manufacturer, including emergency contact information
- Ensure a Chemical Inventory List is maintained either by the company as a whole or for each department or work area.
- Develop and implement a method of communication between any contractors and the company which describes and outlines:
- The method used to communicate hazards and precautions
- The method used to access an SDS
- The method used to communicate emergency situations
- The labeling methods used
- Review this program annually to assure the above requirements are met.

2.1.2 Employees

Attend Hazard Communication Training upon initial assignment, and when changes to the workplace hazards occur (through process changes or a change of work assignment).

- Re-label any containers into which hazardous chemicals or mixtures are transferred.
- Labeling includes the name of the material, manufacturer name and phone number, and appropriate hazard warnings.
- Inform management of any changes to chemicals or chemical uses.

2.1.3 Safety Officer

- Assist in the development and maintenance of the written program or training requirements.
- Assist in the determination and evaluation of chemical hazards in the workplace.

3.0 SAFETY

3.1 Trade Secret Information

Trade Secrets are products which, when the chemical identity of the product is revealed, would jeopardize the manufacturer's competitive advantage. Trade secret materials (and requests to reveal trade secret information) must comply with the requirements of OSHA 1910.1200(i) and Appendix D.

Trade Secret information must be revealed to a health care professional when either:

- A medical emergency exists, or
- In a non-emergency situation, when a healthcare or safety professional, toxicologist or similar person provides a detailed written request.
- Alternatively, other reason such as the following situations seen below:
- A hazard exposure evaluation depends upon the information
- To conduct sampling to determine exposure levels (including medical surveillance or pre-assignment) to potentially exposed employees
- To provide medical treatment to exposed employees
- To assess PPE requirements for exposed employees
- To design or assess engineering controls for exposed employees
- To conduct health assessment and health-effect studies
- Signed confidentiality statements may be required.

3.1.1 Personal Protective Equipment Requirements

Based on the types of hazardous materials at the workplace, employees must be provided with personal protective equipment. Training must be provided as needed for protective equipment use.

Personal Protective Equipment, which includes:

- Gloves,
- Eyewear,
- Head or Foot Protection,
- Protective Clothing,
- Respiratory Protection, and
- Hearing Protection

a. Also, other Equipment such as:

- ❖ Eyebath Stations or Emergency Showers.
- ❖ Tools and receptacles for maintenance and disposal must be provided and employees informed of their use.
- ❖ Eyebaths must be approved types (personal eyewash bottles are NOT approved equipment, stations must be either permanently plumbed or portable stations that are capable of delivering a set amount of flushing fluid for 15 minutes).
- ❖ MSDS's or SDS's for chemicals and products no longer made by the company are kept on file for at least 30 years, and appropriate information is made available upon written request.

4.0 TRAINING

All employees and contractors must be made aware of the hazards they may encounter and the precautions they must take to protect themselves from these hazards.

Employees or contractors must be trained on initial assignment and whenever any new physical, chemical or health hazards are introduced, when non-routine tasks or procedures are required, or when employees are working with or near unlabeled piping systems that contain hazardous chemicals.

Train and inform employees on initial assignment and whenever a new physical, chemical or health hazard is introduced into the workplace, or when non-routine tasks or procedures are required.

Training includes:

- Training information on the hazardous chemicals they may be exposed too.
- Information on the methods used to detect the presence or release of chemicals in the workplace (monitors, alarm systems, odors, visual appearance, etc.).
- The information required in the OSHA Standard.
- Identification of the work areas where hazardous chemicals are used.
- The location and availability of the written program, chemical inventory list(s), and SDS.
- Also, information on the methods and observations used to detect the presence or release of chemicals (monitors, alarm systems, odors, visual appearance, etc.) including:
- Any “non-routine” tasks that employees may be asked to perform periodically outside of their regularly assigned duties
- The physical and health hazard information of the chemicals present
- The measures employees can take to protect themselves from identified chemical hazards (procedures, personal protective equipment, etc.)
- The labeling system used in the workplace
- The details of this program
- The requirements of use, handling, storage and disposal of any Personal Protective Equipment

4.1.1 Training Requirements

Employees who have exposures or who have potential exposures must be trained:

- Upon initial assignment.
- When new hazards are introduced into the workplace.
- When tasks or processes change, requiring new or different information be provided.
- The measures employees can take to protect themselves from identified chemical hazards (procedures, personal protective equipment, etc.).

5.0 PROCEDURE

5.1 General

- Determine if hazardous chemicals are present in the workplace.

- Ensure the availability of a Safety Data Sheet (SDS) for each hazardous chemical or mixture in the workplace.
- Ensure a Hazardous Chemical Inventory List is maintained.
- Evaluate the hazards for each chemical or mixture used and/or stored in the workplace.
- Ensure proper labeling of chemical container.
- Create and maintains a written program.
- Train employees.

5.1.1 Chemical Lists

Ensure a Chemical Inventory List is maintained either by the company as a whole or for each department or work area. Chemical lists must include:

- The trade-name of the chemical or material as it appears on the SDS
- The name of the chemical or material (if it is different than the manufacturer's trade name)
- The manufacturer's name
- The manufacturer's telephone number
- Emergency contact information (company name and telephone number) if different than the manufacturer

5.1.2 Evaluation of Each Hazards Chemical

Evaluate the hazards for each chemical or mixture used or stored in the workplace:

- Determine if the quantity or type of chemical presents a hazard to the employees, the nature of the hazards, and the means that employees will use to protect themselves from these hazards.
- The information is found on the Safety Data Sheet (SDS) for the product. A safety professional or certified industrial hygienist may assist in this evaluation.

5.1.3 Hazard Communication Program

Maintain a written hazard communication program. This program must contain or describe:

- A list of hazardous chemicals
- Access to and maintenance of a current SDS
- Labeling procedures
- Protective measures
- Training program elements
- Provisions for contractors (multi-employer workplaces)
- Procedures for evaluating the hazards of any non-routine tasks (e.g. one- time chemical uses) and for evaluating any unlabeled pipes in the work area that contain hazardous chemicals

5.1.4 Labels and other Forms of Warning

Assure labels and other forms of warning are affixed to chemical containers, as appropriate. Full labeling:

- All containers must be labeled with the chemical name, appropriate hazard warnings, and the manufacturer name and address. Vendor labels should be in compliance. Such labels may not be defaced or covered.

  a. Shortened labeling:

  - ❖ Maybe used for process materials and must contain the chemical identity (referenced back to the SDS), and appropriate hazard warnings and the SDS.
  - ❖ Labels should be on all containers at all times. However, labels are not required for portable containers provided they are immediately used by the employee on that work-shift and remain under the direct control of the employee at all times.
  - ❖ All labels must be in legible English. Other languages may be used, provided a label in English is also provided.
  - ❖ Pipes or piping systems that contain a hazardous chemical shall be identified to employees by at least one (1) readily accessible label, sign, placard, written operating instructions, process sheet, batch ticket or substance identification system.

5.1.5 Information for Safety Data Sheets (SDS)

Obtained Safety Data Sheets (SDS) for each hazardous chemical used in the workplace are:

- Readily accessible and available to all employees
- Hazardous chemical information is provided to employees on multiple worksites or multiple employer worksites
- Written in English
- Obtained from the manufacturer or supplier of the chemical or material before it is used in the workplace if one did not accompany the shipment
- Kept for the duration of employment plus 30 years if a chemical over- exposure has occurred
- Kept for the duration of its use or storage, at a minimum. (It is recommended that all SDS's be kept for the duration of the employment of a person using the material.)
- Kept in a single area and filed alphabetically by name (recommended). However, current copies may be kept in each work area

6.0 RECORDKEEPING

6.1 Required Documentation and Records:

- Safety Data Sheets
- Chemical Inventory Lists
- Training Records

6.1.1 Obsolete MSDS's/SDS's or Discontinued Products

SDS's for products no longer used at company facilities and job sites are kept on file in a "discontinued SDS" file for at least 5 years from the last date of use.

SDS's for chemicals and products no longer made by the company are kept on file for at least 30 years, and appropriate information is made available upon written request.

7.0 REFERENCES

1.	**Documents & External References** http://scalesnw.com/wordpress/wp-content/uploads/Confined-Space-Program_2016.pdf., Reference: OSHA Standard 1910.1200.

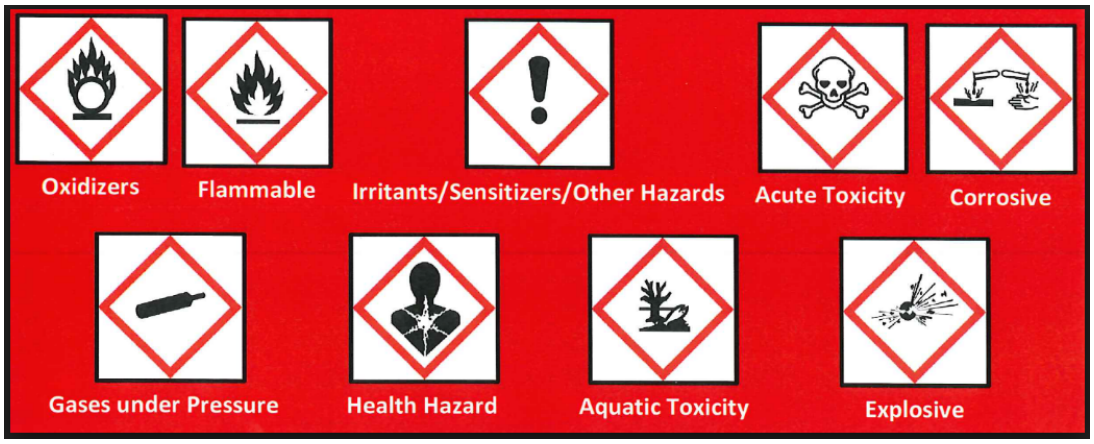
8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Globally Harmonized System Pictograms



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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This document covers Robinson Brothers Construction, Inc.'s program related to *Hazardous Waste Operations and Emergency Response Plans* commonly referred to as *HAZWOPER*. This program will outline Robinson Brothers Construction, Inc. employee's responsibility and training requirements as a first responder at the awareness level in compliance with the regulation in this document.

1.1 Scope

Robinson Brothers Construction, Inc.'s Hazardous Waste Operations and Emergency Response Program (HAZWOPER) shall be used by all company operations both in business units and project operations, our compliance with 29 CFR 1910.120 will focus primarily on training for emergency response as specified by paragraph (q) "Emergency Response Program to Hazardous Substance Releases."

1.1.1 Company Policy

- **Training** - All Robinson Brothers Construction, Inc. employees shall be trained in the Robinson Brothers Construction, Inc. HAZWOPER Program as needed per assignment.
- **First Responder Awareness Level** - Unless specific plans, actions and training have been implemented otherwise, Robinson Brothers Construction, Inc. employee's participation in HAZWOPER emergency response operations will be limited to First Responder Awareness Level.
- **Stop the Work** - Robinson Brothers Construction, Inc. employees are to stop the work and immediately inform their supervisor if they witness, discover or suspect a hazardous substance release, spill or emergency.
- **Incident Reports** - All HAZWOPER related events resulting in injury, illness or direct employee exposure to a hazardous substance shall be recorded as Incidents on a Robinson Brothers Construction, Inc. Incident Report.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
IDLH or Immediately dangerous to life or health	An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would interfere with an individual's ability to escape from a dangerous atmosphere.
Hazardous Substance	Any substance designated or listed under (A) through (D) of this definition, exposure to which results or may result in adverse effects on the health or safety of employees: [A] Any substance defined under section 103(14) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C. 9601). [B] Any biologic agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation,

	or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring. [C] Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and [D] Hazardous waste as herein defined.
Hazardous materials response (HAZMAT) team	An organized group of employees, designated by the employer, who are expected to perform work to handle and control actual or potential leaks or spills of hazardous substances requiring a possible close approach to the substance. The team members perform responses to releases or potential releases of hazardous substances for the purpose of control or stabilization of the incident. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade or fire department.
Hazardous Waste	[A] A waste or combination of wastes as defined in 40 CFR 261.3, or [B] Those substances defined as hazardous wastes in 49 CFR 171.8.
Hazardous Waste Operation	Any operation conducted within the scope of this standard.
Hazardous Waste Site	Any facility or location within the scope of this standard at which hazardous waste operations take place.

2.1 Responsibilities

2.1.1 Regulatory References

This HAZWOPER Program is primarily intended to satisfy the following regulatory requirements:

- 29 CFR 1910.120 paragraph (q) “Emergency Response”

2.1.2 Management

Robinson Brothers Construction, Inc. Management is responsible for the following:

- Ensure that the HSE Management System includes an HAZWOPER Program and that the program is reviewed annually and revised as necessary.
- Provide HAZWOPER training for all Robinson Brothers Construction, Inc. employees as needed per assignment.
- Provide resources to implement and maintain the HAZWOPER Program.
- Provide leadership and guidance in resolving issues or corrective actions related to HAZWOPER concerns, events, releases or emergencies.

2.1.3 Supervision

Robinson Brothers Construction, Inc. Supervisors are responsible for the following:

- Understand and enforce Robinson Brothers Construction, Inc.’s HAZWOPER Program.
- Provide on-the-job training for all employees regarding Robinson Brothers Construction, Inc.’s

HAZWOPER Program.

- Document and maintain all training records required by this program.
- Report all Incidents, and Near Misses as required by this program.
- Ensure all employees are informed of the location of safety shower and eyewash stations, emergency evacuation routes and assembly points, methods of alarm and any other relevant details of the emergency response and evacuation plan.
- Robinson Brothers Construction, Inc. supervisors are to stop the work and immediately inform appropriate personnel if they witness, discover or suspect a hazardous substance release, spill or emergency.
- Robinson Brothers Construction, Inc. supervisors are to follow all instructions and directives from a Hazardous Response Team member or Incident Commander.

2.1.4 Senior Official or Commander

The senior official at an emergency response site is the most senior official on the site who has the responsibility for controlling operations at the site.

2.1.5 Employees

Robinson Brothers Construction, Inc. Employees are responsible for the following:

- Robinson Brothers Construction, Inc. employees shall participate in and understand HAZWOPER
- Training and their role and responsibilities in an emergency.
- Robinson Brothers Construction, Inc. employees shall know the location of safety shower and eyewash stations, emergency evacuation routes and assembly points, methods of alarm and any other relevant details of the emergency response and evacuation plan.
- Robinson Brothers Construction, Inc. employees are to stop the work and immediately inform their supervisor if they witness, discover or suspect a hazardous substance release, spill or emergency.
- Robinson Brothers Construction, Inc. employees are to stop the work and immediately inform their supervisor if they suspect the work is unsafe or a hazard exists that was not identified by the JSA and control methods discussed.
- Robinson Brothers Construction, Inc. employees are to follow all instructions and directives from a Hazardous materials response (HAZMAT) team member or Incident Commander.

3.0 SAFETY

3.1 Site-specific safety and health plan part of the program

3.1.1 General

The site safety and health plan, which must be kept on site, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.

3.1.2 Elements

The site safety and health plan, as a minimum, shall address the following:

- Safety and health risk or hazard analysis for each site task and operation found in the work plan.

- Employee training assignments to assure compliance.
- Personal protective equipment to be used by employees for each of the site tasks and operations being conducted as required by the personal protective equipment program.
- Medical surveillance.

Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used:

- Site control measures in accordance with the site control program
- Decontamination procedures
- An emergency response plan meeting for safe and effective responses to emergencies, including the necessary PPE and other equipment.
- Confined space entry procedures.
- A spill containment program.

a. Pre-entry briefing

The site-specific safety and health plan shall provide for pre-entry briefings to be held prior to initiating any site activity, and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed. The information and data obtained from site characterization and analysis work required shall be used to prepare and update the site safety and health plan.

b. Effectiveness of site safety and health plan

Inspections shall be conducted by the site safety and health supervisor or, in the absence of that individual, another individual who is knowledgeable in occupational safety and health, acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

c. Medical Surveillance

Any emergency response person who exhibits signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency shall be provided with medical consultation at no cost to them. This shall include all employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.

3.2 Site Characterization and Analysis

3.2.1 General

Hazardous waste sites shall be evaluated in accordance with this paragraph to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

a. Preliminary evaluation

A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a qualified person in order to aid in the selection of appropriate employee protection methods prior to site entry. Immediately after initial site entry, a more detailed evaluation of the site's specific characteristics shall

be performed by a qualified person in order to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

b. Hazard identification

All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

4.0 TRAINING

All Robinson Brothers Construction, Inc. employees shall be trained in the Robinson Brothers Construction, Inc. HAZWOPER Program as needed per assignment by a competent/qualified person.

4.1 Training Content

Content includes:

a. Upon assignment to a client's facility or to a different process unit in a facility each Robinson Brothers Construction, Inc. employee will be informed of the particular hazardous substances in their work as to:

- The physical characteristics of the substance such as being a solid, liquid or gas, the color, and odor.
- The danger to health, the flammability, and reactivity to other substance such as water.

b. All employees will also be informed of:

- The location of safety showers and alarm stations.
- The Written Emergency Response Plan for the area and their role in an emergency in the event of an emergency.
- The emergency alarms for the area, the evacuation route, and assembly point.

In the event an employee is assigned to an area for longer than 12 months, they will be required to attend a refresher training session.

4.2 Training Frequency

"HAZWOPER Program" training shall be included in Site Specific Orientation training upon mobilization to specific sites. "HAZWOPER Program" training shall be included in the Toolbox Safety Meeting Program and refreshed annually as part of the Emergency Response/Preparedness and HAZWOPER toolbox topic agenda.

5.0 PROCEDURE

5.1 Emergency Response Plan

Robinson Brothers Construction, Inc. has developed a stand-alone *Written Emergency Response* and *Emergency Preparedness Program* which serves as Robinson Brothers Construction, Inc.'s default emergency response plan satisfying responsibilities under 29 CFR 1910.38. Facility specific plans for hazardous substance releases required by 29 CFR 1910.120(q)(1) shall be the client's responsibility.

Unless specific plans, actions, and training have been implemented otherwise, Robinson Brothers Construction, Inc. employee's participation in HAZWOPER emergency response operations will be limited to First Responder Awareness Level.

5.1.1 First Responder Awareness Level

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

A. An understanding of what hazardous substances are, and the risks associated with them in an incident.

B. An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.

C. The ability to recognize the presence of hazardous substances in an emergency.

D. The ability to identify the hazardous substance, if possible.

E. An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.

F. The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.

6.0 RECORDKEEPING

Robinson Brothers Construction, Inc.'s Director of HS&E or designee shall be the custodian of all "HAZWOPER Program" records. All HAZWOPER related events shall be reported:

- **Incident Report:** All HAZWOPER related events resulting in injury, illness or direct employee exposure to a hazardous substance shall be recorded as Incidents on a Robinson Brothers Construction, Inc. Incident Report.
- **Near Miss Reports:** Evacuations, notifications, failures in containment, control methods, isolation, etc., not resulting in employee exposure, illness or injury, but would have resulted in employee exposure, illness or injury if an employee had been in the immediate area shall be record as near miss events on an Robinson Brothers Construction, Inc. Near Miss Report.
- **Control:** Records associated with this program shall be handled in the following manner.
- **Incidents and Near Misses:** Shall be handled per the Incident Reporting and Record Keeping Program.

6.1.1 Retention

Records shall be retained as follows:

- **Training Records:** shall be retained for a minimum of the employee's duration of employment.

7.0 REFERENCES

1.	**Documents & External References** http://Robinson Brothers Construction,

	Inc.shared.us/safety/safetymanual/Safety%20Manual%20Documents/Safety%20Manual%20Sec%20B9%20Hazwoper.pdf, 29 CFR 1910.120 paragraph (q) “Emergency Response”,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This program covers Robinson Brothers Construction, Inc. program related to Hydrogen Sulfide (H2S) hazards in the workplace. The intent of this program is to provide employees with knowledge and guidelines enabling them to anticipate, recognize, evaluate, and control (H2S) hazards and to protect themselves and others from unnecessary Hydrogen Sulfide exposure.

1.1 Scope

The Hydrogen Sulfide Hazard Program and Policy are intended for support of, and use by company operations both in business units and project operations. This program is hazard recognition, and education focused and does not imply that any training associated with this program certifies or qualifies any employee to analyze worksites for Hydrogen Sulfide hazards, measure contaminants or determine safe exposure levels.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Air Supplying Respirator (ASR)	A device that provides Grade D breathing air. There are two types of ASR: Supplied Air Respirator (SAR) and Self-Contained Breathing Apparatus (SCBA).
Contingency Plan	A written document that contains emergency response procedures which provide an organized plan of action for alerting and protecting the public within an area of exposure, prior to an intentional or accidental release of a potentially hazardous volume of H2S.
Immediately Dangerous to Life or Health (IDLH)	Exposure to airborne contaminants that is likely to cause death, or may cause immediate or delayed permanent adverse health effects that might prevent escape from such an environment, for H2S this concentration is 100 ppm
Line Supervisor	A titled position that has assigned authority and responsibility for financials, production, maintenance, projects and personnel for a defined area. In Robinson Brothers Construction, Inc., this could be any supervisor, superintendent, foreman or assistant foreman
Hydrogen Sulfide (H2S)	A gas formed in nature by the decomposition of organic material by bacteria. H2s is found in natural gas, oil, sewers, stagnant water, volcanic gases, sulfur springs and anywhere that organic materials may be broken down.
Parts Per Million (ppm)	Concentration by volume of one part of gas (or vapor), or by weight of a liquid or solid, per million parts of air or liquid.

2.1 Company Policy

- Upon discovery or suspicion of hydrogen sulfide (H2S) being present on a jobsite, Robinson Brothers Construction, Inc. employees are to stop the work immediately, evacuate the area and inform their supervisor.
- It is Robinson Brothers Construction, Inc.'s policy that employees shall not knowingly work on, open, or participate in any way in operations that involve systems known to contain hydrogen sulfide (H2S) until the system has been declared safe by a competent person.
- All employees assigned to job sites where exposure to Hydrogen Sulfide may be possible shall participate in the identification, evaluation, and control of Hydrogen Sulfide hazards prior to performing work.
- Employees assigned to work in areas where exposure or possible exposure to Hydrogen Sulfide hazards exists will be required to monitor the immediate work area with a fixed field monitor or by utilizing a personal H2S monitor.
- Personal H2S monitors must be worn in the upper breathing zone on the outside of all clothing with the sensor facing outwards and unobstructed.
- Fixed field monitors, as well as personal H2S monitors, must be set to alarm when the permissible exposure limit (PEL) of 20 ppm for general industry is reached or exceeded, and 10 ppm for the construction industry is reached or exceeded.
- *29 CFR 1910.1000 table Z-2* indicates the acceptable ceiling concentration for Hydrogen Sulfide is 20 parts per million (ppm). Ceiling concentrations shall not be exceeded at any point during an 8-hour shift. A peak of 50 parts per million (ppm), is permissible for 10 minutes, once only during an 8-hours shift.
- Exposures in excess of these values shall initiate written (H2S) Safe Work, Confined Space Entry and Permit to Work type procedures.
- All affected employees working with Hydrogen Sulfide shall respond to chemical release alarms by evacuating the area or donning the SCBA's or airline respirators, and
- Medical surveillance shall be limited to that required for long-term exposure.

2.2 Responsibilities

2.2.1 Management

Robinson Brothers Construction, Inc. Management is responsible for the following:

- Reinforce adherence to this protocol and provide resources for application of the protocol.
- Ensure employees are trained appropriately for working around H2S.

2.2.2 Line Supervisor

- Understand how this protocol applies to personnel in their area of responsibility.
- Ensure employees have training, skills, knowledge and understanding to comply with this protocol.
- Check periodically to ensure the requirements of this protocol are being met.

2.2.3 Environmental, Health and Safety

- Provide technical resources and tools for protocol application.
- Monitor compliance through the audit process.

2.2.4 Employees

- Adhere to the requirements of this protocol.
- Identify and report gaps in this protocol.
- Complete required training.

2.2.5 Contract Company Representative

Comply with regulatory requirements and follow the Robinson Brothers Construction, Inc. EHS protocols.

3.0 SAFETY

3.1 Controls & Protection

3.1.1 Engineering Controls

Hydrogen Sulfide is an extremely dangerous toxic gas. Engineering controls are preferred as a method of reducing hazardous exposures. Wherever possible, exposure should be minimized by employing methods such as ventilation and isolation. Where engineering controls cannot adequately control levels of exposure, it may be necessary to supplement them with the use of suitable personal protective equipment (PPE) such as supplied-air respirators.

3.1.2 Safe Working Practices

Any operation that exposes personnel to potential sources of Hydrogen Sulfide or Confined Spaces must utilize a permit to work process such as the Confined Space Entry Program. Established procedures ensure a comprehensive consideration of all elements including hazard identification, safe work practices, PPE, emergency response plans and controlled access. Any work that must be conducted in a known or suspected Hydrogen Sulfide hazard not fully controlled by engineering methods must follow the *OSHA Confined Space Entry Standard 1910.146*, and a written (H2S) Safe Work Procedure approved by a Certified Industrial Hygienist or safety professional, competent in (H2S) hazards.

3.1.3 Protection

Because of the potential severity of the hazard associated with this substance, stringent PPE control measures are necessary but are only a back-up to engineering and safe work practice controls. Robinson Brothers Construction, Inc. employees shall not work in locations with a measurable concentration of Hydrogen Sulfide (H2S) gas unless a written Safe Work Procedure has been developed and approved by a competent individual for (H2S) hazards.

3.1.4 Inhalation PPE

Because of the nature of Hydrogen Sulfide, respiratory protection will be a primary component of any (H2S) hazard control plan. Only a Certified Industrial Hygienist or safety professional, competent in (H2S) hazards and protection shall select and approve PPE for (H2S) Safe Work Procedures. Respiratory protection will likely be of the following types:

- Positive pressure, full-face piece Self-Contained Breathing Apparatus (SCBA)
- Positive pressure, full-face piece Supplied-Air Respirator
- (SAR) with an auxiliary positive pressure SCBA.
- **Escape:** Gas mask with organic vapor canister, or escape- type SCBA.

4.0 TRAINING

Robinson Brothers Construction, Inc. will provide Hydrogen Sulfide training for all employees assigned to at-risk locations.

4.1 Training Content

Training will cover the following topics:

- Hydrogen Sulfide Hazard Training,
- Robinson Brothers Construction, Inc. Hydrogen Sulfide Program,
- Responsibilities, and
- Hazard Recognition & Control

4.1.1 Personnel Training

Robinson Brothers Construction, Inc. personnel shall receive the following training:

- All employees assigned to at-risk locations shall receive Hydrogen Sulfide Hazard training.

4.1.2 Training Frequency

Training and re-training frequency shall be as follows:

- Initial training shall take place when employees mobilize to job-sites with known Hydrogen Sulfide hazards.
- Hydrogen Sulfide Hazard training shall be refreshed as needed as part of the Safety Program, Hazard Communication, and Industrial Hygiene agenda.

5.0 PROCEDURE

5.1 Hazard Recognition & Control

Hydrogen sulfide (H2S), is an extremely hazardous, toxic compound:

- It is a colorless, flammable gas that can be identified in relatively low concentrations, by a characteristic rotten egg odor.
- The gas occurs naturally in coal pits, Sulphur springs, gas wells, and as a product of decaying sulfur-containing organic matter, particularly under low-oxygen conditions. It is therefore commonly encountered in places such as sewers, sewage treatment plants (H2S is often called sewer gas),
- Hydrogen sulfide has a very low odor threshold, with its smell being easily perceptible at concentrations well below 1 parts per million (ppm) in air. The odor increases as the gas becomes more concentrated, with the strong rotten egg smell recognizable up to 30 ppm.

- Above this level, the gas is reported to have a sickeningly sweet odor up to around 100 ppm. However, at concentrations above 100 ppm, a person's ability to detect the gas is affected by rapid temporary paralysis of the olfactory nerves in the nose, leading to a loss of the sense of smell. This means that the gas can be present at dangerously high concentrations, with no perceivable odor.
- Prolonged exposure to lower concentrations can also result in similar effects of olfactory fatigue. This unusual property of hydrogen sulfide makes it extremely dangerous to rely totally on the sense of smell to warn of the presence of the gas.
- H2S is soluble in water, oil, alcohol, and many other solvents. H2S is a flammable gas and burns with a blue flame producing Sulfur Dioxide—a very irritating gas

5.2 Hydrogen Sulfide Is Found

The gas occurs naturally in sewers, septic tanks, livestock waste pits, manholes and well pits. Hydrogen sulfide gas also can be found in groundwater, especially in wells near oil fields or in wells that penetrate shale or sandstone.

Industrial sources of hydrogen sulfide include petroleum and natural gas extraction and refining, pulp and paper manufacturing, rayon textile production, leather tanning, chemical manufacturing and trucks that transport chemical wastes may release hydrogen sulfide gas.

a. **Hydrogen sulfide gas also is found in petroleum and natural gas**:

Natural gas can contain up to 28 percent hydrogen sulfide gas so it may be an air pollutant near natural gas production areas and petroleum refineries. The gas also can be produced by industries that work with sulfur compounds.

5.3 Health Hazards Associated with Hydrogen Sulfide

a. Inhalation

H2S is classified as a chemical asphyxiate, similar to carbon monoxide and cyanide gases. It inhibits cellular respiration and absorption of oxygen, causing biochemical suffocation. At 10-50 ppm, typical exposure symptoms include a headache, dizziness, nausea and vomiting, coughing and breathing difficulty. At a concentration of 50-200 ppm, symptoms include severe respiratory tract irritation, shock, convulsions, coma, and death in severe cases.

b. Absorption

Because (H2S) is so fast acting, absorption through the skin is not generally a concern, although (H2S) does affect and lead to eye problems.

c. Long Term Health Effects of Exposure to Hydrogen Sulfide

Long-term exposure to (H2S) can result in chronic poisoning. Symptoms include eye irritation, acute conjunctivitis, bronchitis, dizziness, headaches, sensitivity to light and a gray-green line on the gums.

5.4 Site Contingency Plans

Develop an H2S Contingency Plan, ensure that all employees are aware of site-specific contingency and emergency plans. The contingency plan will be available upon request and will be on-site where the plan would be activated and discussed during the pre-task discussion. Include the following elements within the H2S contingency plan:

- The Procedures for activation of the contingency plan,
- Process for alerting personnel,
- Process for assisting distressed employees,
- Measures for identifying, alerting, assisting and evacuating the general public within the area of exposure,
- Emergency contacts,
- A diagram or map of the area of exposure,
- Required safety equipment and supplies,
- Process for accounting for evacuated employees,
- Established public awareness of plans, and
- A liaison with emergency responders and public officials.

5.5 First Aid & Exposure Response

- If a person is overcome by H2S gas, do not attempt to rescue unless you are properly trained, authorized and have the proper level of personal protective equipment. At levels above 200 ppm, collapse, coma, and death due to respiratory failure can occur within seconds after only a few inhalations so you can be overcome very quickly.
- Emergency response and rescue will be part of any written (H2S) Safe Work Procedure and Confined Space Entry Procedure. Follow the approved procedures and permit to work process. After the victim has been removed to a fresh air location, check for breathing. If breathing has stopped, trained personnel should begin artificial respiration or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Seek medical attention immediately.

6.0 RECORDKEEPING

The following information is maintained as a result of this process:

a. Training — All training shall be documented.

b. Reports — All Hydrogen Sulfide related events shall be reported.

c. Incident Report — All Hydrogen Sulfide exposure shall be recorded as incidents on a Supervisor Incident Report.

d. Near Miss Reports — Failures in containment, control methods, isolation, etc., not resulting in employee exposure, but would have resulted in employee exposure if an employee had been in the immediate area shall be recorded as near miss events on a Robinson Brothers Construction, Inc. Near Miss Report.

e. Control & Retention — Records associated with this program shall be handled in the following manner. H2S incidents shall be handled per the Incident Reporting and Record Keeping Program. Records shall be retained for a minimum of the employee's duration of employment plus 30 years

7.0 REFERENCES

1.	**Documents & External References**

	29 CFR 1910.1000, 29 CFR 1926.64, Safety Manual Sec C4 Hydrogen Sulfide Policy, http://www.devonenergy.com/documents/Supply-Chain/EHS-Requirements/Hydrogen-Sulfide-Protocol.pdf.

8.0 REVISION INFORMATION

This is applicable to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The basic purpose of these investigations is to determine measures that can be taken to prevent similar incidents in the future. This section addresses:

- Robinson Brothers Construction, Inc. Policy
- Management Responsibilities
- Hazard Control
- Role of Supervisors
- Investigation Procedures.

1.1 Scope

This policy applies to any and all work-related incidents and close calls that affect Robinson Brothers Construction, Inc. employees and others who are performing work for the Robinson Brothers Construction, Inc..

1.2 Policy

It is the policy of the Robinson Brothers Construction, Inc., that investigation of all work-related incidents, injuries and illnesses are to be conducted in a professional manner to identify probable causes and are used to develop specific management actions for the prevention of future incidents. Each incident will be investigated to the appropriate level with regard to the incident severity.

- Near miss incidents and minor first aid cases will be investigated by on-site supervision with participation from involved employees to determine general cause of the incident and determine applicable corrections to be applied.
- Incidents that have the potential to result in a serious safety or environmental consequences shall be investigated.
- All incident investigations shall be conducted by personnel knowledgeable in investigation techniques, processes involved, and other relevant specialties to the operation.

a. The incident investigation process shall address all of the following components:

- ❖ The nature of the incident, and
- ❖ Human and/or other contributing factors leading to the incident.

Recommended changes identified as a result of the investigation.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Incident	An incident is an event or chain of events which has or could have caused occupational injury, ill health, and/or damage (loss) to people, assets or reputation. Incidents may involve actual or potential injury/illness, property/environment damage, motor vehicle accidents or near-misses.
Hazard	Any situation, substance, activity, event or environment that could potentially cause injury or ill health, damage to property/plant/equipment, or damage to the environment
Near Miss	An incident that occurred at the place of work, which although did not result in personal injury/illness or disease, damage to people, property or the environment had the potential to do so. A near miss may highlight workplace hazards and the need to initiate corrective action, e.g.: tripping without falling.
Supervisor	An Institute Staff member with supervisory responsibilities, either of students or other staff. Staff supervisors will include Commercial Managers, Support Managers, and Executive Officers. Student Supervisors will include teaching staff, as well as the listed staff supervisors.
Property Damage	Any incident that results in damage to property; i.e. company assets including vehicles, equipment, buildings, and plant, etc.
Work Injury	An injury or disease which arises out of, or is linked with or occurs during a person's employment.
Risk	Risk is the likelihood of injury or harm resulting from exposure to a hazard

2.1 Responsibilities

2.1.1 Management

Oversee all necessary medical care for injured workers or escort injured employees to appropriate medical facility if required.

- Conduct incident prevention and investigation training for supervisors.
- Ensure all incidents and injuries are properly investigated.
- Ensure immediate and long-term corrective actions are taken to prevent reoccurrence.
- Maintain incident, injury and illness reports permanently on file.
- Provide all necessary equipment and resources to conduct an investigation.
- Document and communicate all investigation findings and corrective actions to all Robinson Brothers Construction, Inc. employees via a Safety Alert document or any other effective system.

2.1.2 Supervisors

- Provide First Aid for any injured persons.
- Eliminate or control hazards.

- Take action to protect people and property from secondary effects of incidents.
- Conduct immediate initial incident investigations.
- Ensure responsibilities for incident investigation are assigned prior to the occurrence of an incident.
- Report all incidents to management as soon after the event as possible.
- Collect and preserve all evidence that may be useful in an investigation.
- Conduct interviews of witnesses in a polite, professional manner to confirm statements.
- Document incident scene information to determine the cause.

2.1.3 Employees

- Immediately report all incidents & injuries to their supervisor,
- Assist as requested in all incident investigations,
- Report all hazardous conditions and incidents involving near-misses to supervisors, and
- For injured employees working independently without direct supervision, such as on an offshore platform, the operations manager responsible for the affected employee will be responsible for initiating the investigation process or appointing someone to initiate the process.

3.0 SAFETY

3.1 Notifiable Incident:

Notification is required to Robinson Brothers Construction, Inc. when an incident at a workplace or incidents involving items of plant/equipment used at the workplace or site results in:

(a) The death of any person,

(b) A person requiring medical treatment within 48 hours of exposure to a substance, and

(c) A person requires immediate treatment as an inpatient in a hospital.

A person requiring immediate medical treatment for:

- Amputation
- Serious head injury
- Serious eye injury
- Separation of skin from underlying tissue (for example degloving or scalping)
- Electric shock
- Spinal injury
- Loss of bodily function
- Serious lacerations

3.1.1 Notifiable Dangerous Occurrence:

A Dangerous Occurrence is an incident at a workplace which may seriously endanger the health and safety of people in the immediate vicinity:

- The collapse, overturning, failure or malfunction of, or damage to, any item at the facility,
- The collapse or failure of excavation, or the shoring support of excavation,
- The collapse or partial collapse of any part of a building or structure,
- An implosion, explosion or fire,
- The escape, spillage, or leakage of substances, and
- The fall from a height of dangerous or heavy objects.

4.0 TRAINING

Training will be completed prior to assignment with an annual refresher.

- Managers, supervisors and the Health Safety and Environmental (HS&E) Department must be familiar with this policy and associated forms.
- Training in the investigation process such as employee responsibilities and incident investigation techniques, along with the company's specific policy and forms that will be determined by company management and communicated by the HSE.
- The requirement to report and investigate close calls and other incidents will be covered during new employee orientation.

4.1.1 Awareness Level

All employees will be trained at the awareness level of this program and will address reporting of incidents to supervisory personnel, and participate in their roles in incident investigations.

4.1.2 Time Elements for OSHA and Client Notification

Required incidents must be verbally reported to OSHA within 8 hours of their discovery. Incidents must also be reported to the owner client as soon as possible or in a timely manner (within 24 hours of the incident).

5.0 PROCEDURE

Incident prevention and control of hazards is the result of a well-designed and executed HSE program. One of the keys to a successful program includes unbiased, prompt and accurate incident investigations. The basic purpose of these investigations is to determine measures that can be taken to prevent similar incidents in the future. This section addresses:

- Robinson Brothers Construction, Inc. Policy
- Management Responsibilities
- Hazard Control
- Role of Supervisors

5.1 Initial Investigation Procedures

Initial Identification/Assessment of Evidence Initial identification of evidence immediately following the incident could include a listing of people, equipment, and materials involved and a recording of environmental factors such as weather, illumination, temperature, noise, ventilation, etc.

The initial investigation has three purposes:

- Prevent further possible injury or property damage
- Collect facts about the incident
- Collect and preserve evidence

a. Steps

- Secure the area. Do not disturb the scene unless a hazard exists.
- Prepare the necessary sketches and photographs. Label each carefully and keep accurate records. List all equipment and materials involved.
- Record conditions such as weather, temperature, illumination, noise, ventilation
- Interview each victim and witness and interview those who were present before the incident and those who arrived at the site shortly after the incident. Keep accurate records of each interview. Use a tape recorder if desired and if approved.

b. Determine

- What was not normal before the incident?
- Where did the abnormality occur?
- When was it first noted?
- How it occurred?

5.2 Follow-up Incident Investigation

The follow-up investigation is used to analyze data and determine the causes and corrective actions necessary to prevent reoccurrence.

a. Steps

Analyze the data obtained in the initial investigation Repeat any of the prior steps, if necessary.

b. Determine:

- Why did the incident occur?
- A likely sequence of events and probable causes (direct, indirect, basic)
- Determine the most likely causes.
- Conduct a post-investigation briefing.
- Prepare a summary report, including the recommended actions to prevent a recurrence.
- Communicate findings and corrective actions to all employees to prevent reoccurrence.

5.3 Investigation Report

An incident investigation is not complete until a written report is prepared and submitted to management. The majority of incidents will be investigated and reported using an Incident Report form.

5.4 Collection/Preservation and Security of Evidence

Evidence such as people, positions of equipment, parts, and papers must be preserved, secured and collected through notes, photographs, witness statements, flagging, and impoundment of documents and equipment. All shall be dated.

5.5 First Responder & Investigator

All supervisory and designated safety personnel will be trained in this program in the Collection/Preservation and Security of Evidence.

5.6 Review

This policy should be reviewed at least annually, or when a revision is required.
Incident investigation historical records should be reviewed annually by the HSE in order to:

- Confirm that action required was implemented,
- Determine if the action was effective in prevention of recurrence,
- Identify trends, and
- Determine areas for improvement.

6.0 RECORDKEEPING

- All incident reports will be maintained on file permanently.
- They shall receive a timely review by upper management to ensure proper corrective actions have been taken.
- Copies of incident investigations will be electronically filed on a company Intranet or kept in a secure filing area.

6.1 Maintain Corrective Action Log

A Corrective Action Log (CAL) is used to record deficiencies and is included with the HSE's monthly minutes. The CAL is updated and posted every month.

- It identifies an issue,
- Determines the appropriate action,
- Assigns the action to a person,
- Assigns a date for completion of the action, and
- Has an actual completion date.

CAL's are reviewed monthly by the HSE for completion and determination as to the whether the deficiency was addressed to prevent recurrence.

7.0 REFERENCES

1.	**Documents & External References** https://www.go2hr.ca/sites/default/files/legacy/ohs/COR101-App5-1.docx., http://www.gotafe.vic.edu.au/documents/Procedure/Incident%20reporting%20and%20investigation%

	20procedure.doc.,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

To ensure there are no falls from portable ladders (step, straight, combination and extension) or fatalities and injuries. Robinson Brothers Construction, Inc. will ensure that the employee have the properly rated and type of ladder that will ensure the greatest protection for loss of life or injury possible while performing tasks.

1.1 Scope

This program applies to any use of ladders three (3) feet in height/length or greater for employees on the Robinson Brothers Construction, Inc.s site as part of their normal work activities. This includes temporary employees and Contractors performing activities at the site or facilities.

1.1.1 Applicability

This program shall apply to all operations, either stationary or mobile, where employees use ladders to perform work.

The ladders used by the Robinson Brothers Construction, Inc.'s employees must meet OSHA/ANSI specifications.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Cleat	A ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.
Extension Trestle Ladder	A self-supporting portable ladder, adjustable in length consisting of a trestle ladder base and a vertically adjustable extension section, with a suitable means for locking the ladders together.
Individual-Rung/Step Ladders	A Ladders without a side rail or center rail support. Such ladders are made by mounting individual steps or rungs directly to the side or wall of the structure.
Portable Ladder	A ladder that can be readily moved or carried.

2.1 Responsibilities

2.1.1 Operations Manager

- Develop the written Ladder Safety Program and revise the program as necessary.
- Identify type and capacity requirements of ladders needed to perform routine tasks safely.

- Train employees on the Ladder Safety Program and proper use of ladders.

2.1.2 Supervisors

- Ensure that employees are properly using ladders for what they are designed for
- Ensure ladders are inspected prior to use
- Route safety concerns and requests to management

2.1.3 Employees

- Inspect ladders
- Report deficiencies to supervisor

3.0 SAFETY

3.1.1 Ladder Selection

The American National Standards Institute (ANSI) requires that a duty rating sticker is placed on the side of each ladder. When selecting a ladder, ensure that the ladder has an adequate proper duty rating to support the combined weight of the user and the material. Materials include the weight of clothing, protective equipment, and supplies being carried or stored on the ladder. The ladder duty ratings are as follows:

Ladder Duty Rating or "Type."	Capable of Supporting	Rated Use
TYPE IAA	375 lbs.	Special Duty
TYPE IA	300 lbs.	Extra Heavy Duty Industrial
TYPE I	250 lbs.	Heavy Duty Industrial
TYPE II	225 lbs.	Medium Duty Commercial
TYPE III	200 lbs.	Light Duty Household

4.0 TRAINING

Employees shall be trained on all of the rules and regulations pertaining to ladder and stair safety, including the proper installment, care, use and handling, and storage.

Additional training shall be conducted in response to the following circumstances:

- Whenever changes in the workplace or this procedure render previous training obsolete,
- When inadequacies in the employee's use and handling indicate that the employee has not retained the requisite understanding or skill, and
- When any other situations arise in which retraining appears necessary to ensure the proper installment, care, use and handling, and storage.

5.0 PROCEDURE

5.1 General Requirements

5.1.1 Ladder Construction

Ladders must meet the following minimum requirements:

- ANSI A14.10 standard
- Fiberglass construction
- Capacity rated above 300 pounds
- Type IA or IAA
- Ladder types for portable ladders may be self-supporting stepladders or non-self-supporting extension ladders.
- Non-self-supporting ladders are to be positioned at such an angle that the horizontal distance from the top support to the foot of the ladder is about 1/4 the working length of the ladder.
- Ladder rungs, cleats, or steps must be parallel, level, and uniformly spaced when the ladder is in position for use. Rungs must be spaced between 10 and 14 inches apart.
- For extension trestle ladders, the spacing must be 8-18 inches for the base and 6-12 inches on the extension section.
- Rungs must be so shaped that an employee's foot cannot slide off, and must be skid-resistant.
- Ladders are to be kept free of oil, grease, wet paint, and other slipping hazards.
- Foldout or stepladders must have a metal spreader or locking device to hold the front and back sections in an open position when in use.

5.1.2 Ladder Inspections

- Ladders must be periodically inspected and inspected before each use. A monthly inspection is also required to be documented.
- Ladders should be inspected for the following criteria before use:
  - ❖ Ladders with loose or missing parts must be rejected.
  - ❖ Ladders with cracked side rails and bent rungs must be rejected
  - ❖ Rickety ladders that sway or lean to the side must be rejected.
  - ❖ The ladder you select must be the right size for the job
  - ❖ The Duty Rating of the ladder must be greater that the total weight of the climber, tools,
  - ❖ supplies, and other objects placed upon the ladder.
  - ❖ The length of the ladder must be sufficient so that the climber does not have to stand on the top rung or step.

- ❖ Ladders that do not pass inspection must be tagged out with a DO NOT USE tag, reported to management and removed from service.

5.1.3 Ladder Use

This section addressed how to use ladders safely the following safe practices are listed below:

- Do not attempt to climb a ladder If you feel tired or dizzy or are prone to losing your balance.
- Do not use ladders in high winds or storms.
- Wear clean slip-resistant shoes. Shoes with leather soles are not appropriate for ladder use since they are not considered sufficiently slip-resistant.
- When the ladder is set-up for use, it must be placed on the firm level ground and without any type of slippery condition present at either the base or top support points.
- When placing extension ladders against the top support, remember the four-to-one (4:1) rule:
  - ❖ For every four feet of height, you have to climb, move the base one foot away from the wall.
- Only one person at a time is permitted on a ladder unless the ladder is specifically designed for more than one climber (such as a Trestle Ladder).
- Ladders must not be placed in front of closed doors that can open toward the ladder. The door must be blocked open, locked, or guarded.
- Do not exceed the ladders load limits.
- Read the safety information labels on the ladder.
- Ladders shall only be used for their intended purpose, and not for:
  - ❖ Ladders will not be used for scaffolding supports
  - ❖ Ladders will not be used as vice or project supports
  - ❖ Ladders will not be used to support structures
- Ladders must extend at least 3’ above the upper landing.
- Upper supports of ladders used to access elevated work areas must extend a minimum of 3 feet above the elevated surface.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or another vertical surface.
- The on product safety information is specific to the particular type of ladder on which it appears. The climber is not considered qualified or adequately trained to use the ladder until familiar with this information.
- Never jump or slide down from a ladder or climb more than one rung/step at a time.
- When climbing a ladder, utilize Three Points-of-Contact to eliminate the chance of slipping and falling from the ladder by following the information below:
  - ❖ Face the ladder and have two hands and 2-foot, or 2-feet and one hand in contact with the ladder cleats and/or side rails

- ❖ Climber must not carry any objects in either hand that can interfere with a firm grip on the ladder

a. Reduce the risk of falls by:

- Wearing slip-resistant work shoes with arch support and heavy soles to prevent foot fatigue,
- Cleaning the soles to maximize traction;
- Using towlines, a tool belt or an assistant to convey materials so that the climber's hands are free when climbing,
- Climbing slowly and deliberately while avoiding sudden movements,
- Keeping the center of your belt buckle (stomach) between the ladder side rails (or within the width of the cleats) when climbing and while working. Do not overreach or lean while working so that you do not fall off the ladder sideways.

6.0 RECORDKEEPING

Monthly inspections will be recorded on the Vehicle Equipment Inspection Form and kept on file in the operation manager's office and in the vehicle or shop area where the ladder is in use. Employees shall be trained on the following topics prior to portable ladder setup or use:

- Ladder types, compositions, and parts;
- Ladder selection and inspection; and
- Ladder storage, setup, and use.

6.1.1 Equipment Inspections

a. Annual/Periodic Inspections

Keep inspection reports for past three years. May be included as part of the Annual Shop Inspection process.

6.1.2 HSE/Training Requirements

HSE/Training retains indefinitely the following:

- Records of annual shop inspections that include ladders
- Records of training provided by HSE and other entities
- Historical documents and revisions of the Ladder Safety Program

Retain records for ten years after the person has retired or left the company's employment.

Employees shall be retrained after an incident or as necessary to maintain their understanding and knowledge regarding the safe use of ladders. Training records shall be retained by Environmental Health and Safety. Records shall contain the employee name, date of training, and the subject of the training.

7.0 REFERENCES

1.	**Documents & External References** http://scalesnw.com/wordpress/wp-content/uploads/Ladder-Safety.pdf, https://protect.iu.edu/environmental-health/occupational-safety/equipment/portable-ladders.html, 29 CFR 1910.25, 29 CFR 1910.26, ANSI A14.1,14.2,14.5 – 2007, 29 CFR 1926.1053,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

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9.0 APPENDICES

None.

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AUTHORIZATION

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Name & Title

1.0 PURPOSE

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy.

1.1 SCOPE

This procedure applies to all Robinson Brothers Construction, Inc. employees and subcontractors. All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize, or use that machine or equipment.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Authorized (Qualified) Employees	Are the only ones certified to lock and tagout equipment or machinery. Whether an employee is considered qualified will depend upon various circumstances in the workplace. It is possible for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment. An employee who is undergoing on-the-job training and who, obtains such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person, is considered "qualified" for the performance of those duties.
Authorized Employee	A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.
Affected Employee	An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout tagout.
Affected Employees	Are those employees who operate machinery or equipment upon which lockout or tagging out is required under this program. Training of these individuals will be less stringent in that it will include the purpose and use of the lockout procedures.
Energy-Isolating Device	A mechanical device that physically prevents the transmission or release of energy.
Energy Source	Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Lockout Device	Uses a positive means such as a lock to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment.
Tagout Device	A prominent warning device which can be securely fastened to an energy-isolating device.

2.1 Responsibilities

2.1.1 Employer

Employers must establish a written energy control program including:

- Energy control procedures for removing the energy supply from machines and for placing the appropriate LOTO devices on the energy-isolating devices to prevent unexpected reenergization.
- The training of employees on the energy-control program, including the safe application, use, and removal of energy controls.
- A review of these procedures periodically (at least annually) to ensure that they are effective and being followed.

2.1.2 Site Project Manager and Supervisor

The Site Project Manager and Supervisor are to ensure that employees are compliant with the safe work practices. They are also responsible for performing annual review, revise the Electrical Safety Program along with ensuring training and retraining is made available to qualified and unqualified employees

2.1.3 Employees

- Follow the safe work practices and requirements of this document
- Understand all procedure, standards and safe work practices that pertain to their respective job assignments
- Ensure that they are current on training and certifications

2.1.4 Contractors

Contractors, working on company property and equipment must use this Lockout - Tagout procedure while servicing or maintaining equipment, machinery or processes.

3.0 SAFETY

3.1 Personal Protective Equipment (PPE)

Personal protective equipment shall be used to protect from electrical hazards that have not been eliminated by de-energizing or guarding. All personal protective equipment shall be inspected prior to each day's use and immediately after any incident.

3.1.1 Eye Protection

Plastic rimmed safety glasses with side shields meeting ANSI Z87 standards shall be used at all times while working on or near exposed live parts. *(Hazard Rating 0-4)*

3.1.2 Face Protection

- A tinted arc shield with a balaclava-style hood shall be worn when working where there are a danger of flying objects from an electrical arc for (Hazard Rating 1 or 2) hazards
- Safety glasses shall be worn in conjunction with the shield. A full FR hood (beekeeper style) shall be used for high incident energy levels in category 3 or 4. (Hazard Rating 1-4)

3.1.3 Head Protection

Non-conductive hard hats shall be worn where employees are exposed to electrical conductors that could contact the head such as when working on open bus work. (Hazard Rating 0-4).

3.1.4 Hearing Protection

Arc-rated hearing protection is required for all electrical switching of devices or where exposed to energized electrical parts rated greater than 50 volts.

3.2 Hazards

Improper or failure to use Lockout - Tagout procedures may result in:

- Electrical shock
- Chemical exposure
- Skin burns
- Lacerations & amputation
- Fires & Explosions
- Chemical releases
- Eye injury
- Death

3.2.1 Hazard Controls

- Only authorized and trained employees may engage in tasks that requires the use of lockout-tagout procedures
- All equipment has single sources of electrical power
- Lockout procedures have been developed for all equipment and processes
- Restoration from Lockout is a controlled operation

a. Hazardous Energy Source Examples

- Live electrical lines
- Electrical capacitors
- Lasers
- Hydraulic lifts
- Pneumatic (air pressure) lines
- Springs

4.0 TRAINING

4.1 Authorized Employees Training

All Maintenance Employees, Department Supervisors, and Janitorial employees will be trained to use the Lock and Tag Out Procedures. The training will be conducted by the Maintenance Supervisor, Authorized (Qualified) Person, or Safety Coordinator at the time of initial hire. Retraining shall be held at least annually. The training will consist of the following:

- Review of General Procedures
- Review of Specific Procedures for machinery, equipment, and processes
- Location and use of Specific Procedures
- Procedures when questions arise

4.1.1 Affected Employee Training

- Only trained and authorized Employees will repair, replace or adjust machinery, equipment or processes
- Affected Employees may not remove Locks, locking devices or tags from machinery, equipment or circuits.
- Purpose and use of the lockout procedures.

4.1.2 Other Employee Training

- Only trained and authorized Employees will repair, replace or adjust machines or Equipment.
- Other Employees may not remove Locks, locking devices or tags from machinery, equipment
- or circuits

5.0 PROCEDURE

5.1 Preparation for Lock and Tag Out Procedures

A Lockout-Tagout survey has been conducted to locate and identify all energy sources to verify which switches or valves supply energy to machinery and equipment. Dual or redundant controls have been removed.

a. Lockout-Tagout Survey:

- A Tagout Schedule has been developed for each piece of equipment and machinery.
- This schedule describes the energy sources, the location of disconnects, type of disconnect, special hazards and special safety procedures.
- The schedule will be reviewed each time to ensure employees properly lock and tag out equipment and machinery.
- If a Tagout Schedule does not exist for a particular piece of equipment, machinery, and process, one must be developed prior to conducting a Lockout-Tagout. As repairs and/or renovations of existing electrical systems are made, standardized controls will be used.

5.2 Routine Maintenance & Machine Adjustments

In situations where the maintenance or repair worker would be exposed to electrical elements or hazardous moving machine parts while performing the job, there is no question that all power sources must be shut off and locked out before work begins.

Therefore, one of the first procedures for the maintenance person is to disconnect and lock out the machine from all of its power sources, whether the source is electrical, mechanical, pneumatic, hydraulic, or a combination of these. Energy accumulation devices must be "bled down."

5.2.1 Service or Maintenance and Testing of Machines

In some circumstances, employees need to temporarily restore energy to a machine or piece of equipment during servicing or maintenance to test and /or reposition the machine or piece of equipment. Lockout or tagout devices may be removed temporarily in order to perform these tasks.

5.3 Locks, Hasps and Tags

All Qualified Maintenance Personnel will be assigned a lock with one key, hasp and tag. All locks will be keyed differently, except when a specific individual is issued a series of locks for complex lockout-tagout tasks. In some cases, more than one lock, hasp, and tag are needed to completely de-energize equipment and machinery. Additional locks may be checked out from the Department or Maintenance Supervisor on a shift-by-shift basis. All locks and hasps shall be uniquely identifiable to a specific employee.

5.4 Standard Operating Procedure (SOP)/General Lock and Tag Out Procedures

Before working on, repairing, adjusting or replacing machinery and equipment, the following procedures will be utilized to place the machinery and equipment in a neutral or zero mechanical states.

a. Preparation for Shutdown

Before authorized or affected employees turn off a machine or a piece of equipment, the Authorized Employee will have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the means to control the energy.

Note: Notify all affected Employees that the machinery, equipment or process will be out of service.

b. Machine or Equipment Shutdown

The machine or equipment will be turned off or shut down using the specific procedures for that specific machine. An orderly shutdown will be used to avoid any additional or increased hazards to employees as a result of equipment de-energization.

If the machinery, equipment or process is in operation, follow normal stopping procedures (depress stop button, open toggle switch, etc.).

Move switch or panel arms to "Off" or "Open" positions and close all valves or other energy isolating devices so that the energy source(s) is disconnected or isolated from the machinery or equipment.

c. Machine or Equipment Isolation

All energy control devices that are needed to control the energy to the machine or equipment will be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

d. Lockout or Tagout Device Application

Lockout or tagout devices will be affixed to energy isolating devices by authorized employees. Lockout devices will be affixed in a manner that will hold the energy isolating devices from the "safe" or "off" position.

Where tagout devices are used, they will be affixed in such a manner that will clearly state that the operation or the movement of energy isolating devices from the "safe" or "off" positions is prohibited.

The tagout devices will be attached to the same point a lock would be attached. If the tag cannot be affixed at that point, the tag will be located as close as possible to the device in a position that will be immediately obvious to anyone attempting to operate the device.

Lock and tag out all energy devices by use of hasps, chains, and valve covers with an assigned individual lock. The lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

e. Stored Energy

Following the application of the lockout or tagout, isolation/zero energy is verified to confirms that all potential or residual energy is relieved, disconnected, restrained, and otherwise rendered safe.

Where the re-accumulation of stored energy to a hazardous energy level is possible, verification of isolation will be continued until the maintenance or servicing is complete.

Release stored energy (capacitors, springs, elevated members, rotating flywheels, and hydraulic/air/gas/steam systems) must be relieved or restrained by grounding, repositioning, blocking and/or bleeding the system.

f. Verification of Isolation

Before starting work on machines or equipment that have been locked or tagged out, the authorized employees will verify that isolation or de-energization of the machine or equipment have been accomplished.

After assuring that no Employee will be placed in danger, test all lock and tag outs by following the normal start up procedures (depress start button, etc.).

Caution: After Test, place controls in neutral position.

g. Extended Lockout - Tagout

Should the shift change before the machinery or equipment can be restored to service, the lock and tag out must remain. If the task is reassigned to the next shift, those Employees must lock and tag out before the previous shift may remove their lock and tag.

5.5 SOP Release from LOCKOUT/TAGOUT

Before lockout or tagout devices are removed and the energy restored to the machine or equipment, the following actions will be taken:

- The work area will be thoroughly inspected to ensure that nonessential items have been removed and that machine or equipment components are operational.
- The work will be checked to ensure that all employees have been safely positioned or removed.
- Before the Lockout or Tagout devices are removed, the affected employees will be notified that the Lockout or Tagout devices are being removed.

- Each Lockout or Tagout device will be removed from each energy isolating device by the employee who applied the device.

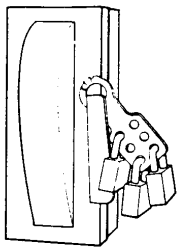
5.6 SOP/ LOTO Procedure for Electrical Plug-Type Equipment

This procedure covers all Electrical Plug-Type Equipment such as (Battery Chargers, some Product Pumps, Office Equipment, Powered Hand Tools, Powered Bench Tools, Lathes, Fans, etc.). When working on, repairing, or adjusting the above equipment, the following procedures must be utilized to prevent accidental or sudden startup:

- Unplug Electrical Equipment from a wall socket or in-line socket.
- Attach "Do Not Operate" Tag and Plug Box & Lock on end of the power cord.
- An exception is granted to not lock & tag the plug is the cord & plug remain in the exclusive control of the Employee working on, adjusting or inspecting the equipment.
- Test Equipment to assure power source has been removed by depressing the "Start" or “On" Switch.
- Perform required operations.
- Replace all guards removed.
- Remove Lock & Plug Box and Tag.
- Inspect power cord and socket before plugging equipment into a power source. Any defects must be repaired before placing the equipment back in service.

NOTE: Occasionally used equipment may be unplugged from the power source when not in use.

5.7 SOP/LOTO Procedures Involving More Than One Employee



An Authorized Qualified Employee is assigned to oversee a group or shift change lockout operation. If more than one Employee is assigned to a task requiring a lock and tag out, each must also place his or her own lock and tag on the energy isolating device(s). Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

5.7.1 SOP/Management's Removal of Lock and Tag Out

Only the Employee that locks and tags out machinery, equipment or processes may remove his/her lock and tag. However, should the Employee leave the facility before removing his/her lock and tag,

the Maintenance Manager may remove the lock and tag. The Maintenance Manager must be assured that all tools have been removed, all guards have been replaced and all Employees are free from any hazard before the lock and tag are removed and the machinery, equipment or process are returned to service. Notification of the employee who placed the lock is required prior to lock removal.

6.0 RECORDKEEPING

A demonstration of employee’s knowledge shall be documented. This can be via written test, documentation of successful completion of training, and by on-site demonstration of understanding through workplace observations. Each employee shall be evaluated at least annually along with the energy control (Lockout/Tagout) procedure, which is inspected and reviewed annually to ensure continued understanding

of *Safe Work Practices, and the Energy control procedures*. See below the records the employer must retain and how long the employer must retain them:

The employer must keep the following records	For at least
i. Current lockout/tags-plus program and procedures	Until replaced by updated program and procedures.
ii. Training records	Until replaced by updated records for each type of training.
iii. Incident investigation reports	Until the next program, audit is completed.
iv. Program audit report	12 months after being replaced by the next audit report.

The employer shall make all records required by this section available to employees, their representatives, and the Assistant Secretary in accordance with the procedures and time periods specified in 29 CFR 1910.1020(e)(1) and (e)(3).

7.0 REFERENCES

1.	**Documents & External References** OSHA Standard 29 CFR 1910. 147, the control of hazardous energy, 29 CFR 1910.1020(e)(1) and (e)(3), https://www.osha.gov/Publications/Mach_SafeGuard/chapt4.html, 29 CFR 1910.147,

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to provide a process to minimize employee hearing loss caused by excessive occupational exposure to noise.

1.1 Scope

This program is applicable to all employees who may be exposed to noise in excess of 85 decibels (decibels). When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Audiometric Testing	means detection by the person being tested of a series of pure tones. For each tone, the person indicates the lowest level of intensity that they are able to perceive.
Decibels	the sound energy measured by a sound level meter using the "A" scale. The "A" scale is electronically weighted to simulate the response of the human ear to high and low-frequency noise.
Standard Threshold Shift	a change in hearing threshold relative to the baseline audiogram of an average of 10 dB (corrected for age) at 2000, 3000 and 4000 Hz in either ear.

2.1 Responsibilities

2.1.1 Managers and Supervisors

- Ensure requirements of this program are established and maintained.
- Ensure hearing protection is evaluated for the specific noise environments in which the protector will be used.
- Ensure employees are trained and comply with the requirements of this program.

2.1.2 Employees

Wear hearing protection when required, attend the training, and cooperate with testing and sampling.

3.0 SAFETY

3.1 Hearing Protectors

Provide a variety of hearing protectors at no cost to the employees. Ensure proper initial fitting and correct use of all hearing-protection devices. Hearing protection is re-evaluated in the event of a standard threshold shift.

3.1.1 Hearing Protector Attenuation

Hearing protectors must attenuate (reduce) noise levels to a TWA of 90 dBA, or to 85 dBA for employees who have had an STS.

4.0 TRAINING

4.1 Training Program

Annually train employees in the Hearing Conservation Program on the following:

1. The effects of noise on hearing.
2. The purpose of hearing protection.
3. The advantages and disadvantages of various types of hearing protection.
4. Selection, use, and care of hearing protection.
5. The purpose of audiometric testing.

5.0 PROCEDURE

5.1 Noise Exposure Noise Awareness

5.1.1 General Requirements

An employer must have in place an effective hearing conservation program whenever employee noise exposures equal or exceed an 8-hour Time Weighted Average (TWA) of 85 decibels measured on the A-scale (85 dBA). A TWA of 85 dBA corresponds to a noise dose of 50%, also called the action level.

Employers must provide protection against the harmful effects of noise when employees are exposed to excessive noise levels (exceeding a TWA of 85 dBA) on the job. If you must raise your voice or shout to be heard above the noise in the workplace, this rule may apply.

5.2 Noise Monitoring

Conduct noise monitoring; include all employees affected by noise exceeding 85 dBA, TWA. Noise dosimetry is a method used to measure noise exposure. Not all employees need to be sampled; however, the noise monitoring must be representative of each affected employee's job. The monitoring should be designed to identify employees for inclusion in a Hearing Conservation Program. All employees must be notified of noise monitoring results that exceed 85 dBA, TWA.

5.3 Noise Controls

If noise levels exceed a TWA of 90 dBA, all feasible measures must be taken to reduce the noise exposure of employees to below 90 dBA. Whenever feasible engineering, administrative, or work-practice controls can be instituted, although insufficient to reduce exposure below the PEL, they shall be required in conjunction with personal protective equipment (PPE) to reduce exposure to the lowest practical level.

5.4 A Hearing Conservation Program

Must be implemented for all employees exposed to noise levels above a TWA of 85 dBA. These five basic components comprise an effective Hearing Conservation Program:

- Exposure Monitoring

- Audiometric Testing
- Hearing Protection
- Employee Training
- Recordkeeping

5.5 Audiometric Testing

Establish and maintain an annual testing program if results from the initial monitoring equal or exceed a TWA of 85 dBA. Baseline audiograms are required within six months from the date of an employee's first exposure to noise above 85 dBA.

Subsequent audiograms are compared to the baseline audiogram to determine hearing loss. Audiometric tests must be performed and the audiogram evaluated by a licensed or certified audiologist, otolaryngologist, or any other physician, or by a *Certified Occupational Hearing Conservationist* (COHC) technician. Before testing employees, advise them to avoid activities that expose them to high levels of noise and to avoid non-occupational exposure (or use hearing protection) within the 14 hours prior to the test.

Compare the employee's annual audiogram to the baseline audiogram. If the comparison shows a standard threshold shift, the employer must either accept the results or retest the employee within 30 days. Repeat the hearing test annually for all employee exposures over 85 dBA, 8-hour time-weighted average.

5.6 Follow-up Procedures

Within 21 days of receiving the report, notify, in writing, each employee whose audiogram shows a standard threshold shift. Employees with a documented hearing loss must be fitted with hearing protectors, trained in their use and care, and required to use them. Employees who were already using hearing protectors must be refitted and retrained. Some employees may need to be referred to a qualified specialist for additional evaluation.

5.7 Standard Threshold Shift (STS)

An STS is a change in hearing, or loss, compared to the baseline of an average of 10 dB or more at 2000, 3000, and 4000 Hertz in either ear. Employees who show an STS and are exposed to a TWA of 85 dBA or above, and employees exposed above 90 dBA, must wear protectors on the job.

5.8 OSHA Appendix B to 1910.95

Requires employers to determine employee TWA exposure with the use of hearing protectors. A method approved by OSHA that is typically used in industry:

1. Determine the employee's noise exposure in dBA, then calculate the noise reduction.
2. Subtract 7 dBA from the noise reduction rating (NRR) of the hearing protector.
3. Subtract this difference from the TWA noise exposure. This remainder equals the TWA under the hearing protector.

Example:
An employee is exposed to a TWA of 88 dBA. The NRR of an ear plug is 32 dB. Calculate the TWA under the protector.

1. Employee exposure = 88 dBA
2. 32 dB - 7 dB = 25 dB

3. 88 dBA - 25 dB = 63 dBA

6.0 RECORDKEEPING

Recordkeeping and Reporting, for occupational hearing loss recording criteria (OSHA 300 log).

6.1 Maintaining Recordkeeping

Maintain all records, including employee exposure measurements and audiograms. Audiometric test records must include the following:

1. Name and job classification of the employee.
2. Date of the audiogram.
3. The examiner's name.
4. Date of the last calibration of the audiometer.
5. The employee's most recent noise exposure measurement.

Records must also include information on the background noise level of the audiometric test booth. Maintain noise exposure measurements for at least two years and audiometric test records for the duration of the affected employee's employment. Provide access to these records to employees and their representatives upon request.

7.0 REFERENCES

1.	**Documents & External References** www.osha.gov/sltc/noisehearingconservation/index.html, www.cdc.gov/nceh/hsb/noise/, www.cbs.state.or.us/external/osha/pdf/pubs/3349.pdf,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to ensure a safe and incident free lifting operation and reduce the potential for serious injury or death while rigging & lifting materials with the overhead crane. This program was developed to communicate the proper techniques of rigging.

1.1 Scope

All Robinson Brothers Construction, Inc. employees that work with rigging & lifting materials with the overhead crane are to receive training in this "rigging" program. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description/Explanation
Crane	A "crane" is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes whether fixed or mobile are driven manually or by power.
Overhead Crane	A crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.
Semi Gantry Crane	A semi gantry crane is a gantry crane with one end of the bridge rigidly supported on one or more legs that run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.
Bridge	That part of a crane consisting of girders, trucks, end ties, footwalks, and a drive mechanism which carries the trolley or trolleys.
Bridge Travel	The crane movement in a direction parallel to the crane runway.
Magnet	An electromagnetic device carried on a crane hook to pick up loads magnetically
Rated Load	The maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).
Rope	Rope refers to wire rope unless otherwise specified.
Switch	A "switch" is a device for making, breaking, or for changing the connections in an electric circuit.
Emergency Stop Switch	An "emergency stop switch" is a manually or automatically operated electric switch to cut off electric power independently of the regular operating controls.
Limit Switch	A "limit switch" is a switch which is operated by some part or motion of a power-driven machine or equipment to alter the electric circuit associated with the machine or equipment.
Main Switch	A "main switch" is a switch controlling the entire power supply to the crane.

2.1 Responsibilities

2.1.1 Managers and Supervisors

- Are responsible for ensuring only designated personnel shall be allowed to operate this equipment and operators should be trained in safe work standards.
- Are responsible for seeing that all provisions of this program are followed, and that crane inspections are performed, and the equipment is in safe operating condition.
- Are responsible for establishing a preventive maintenance program based on the crane manufacturer's recommendations at each site.

2.1.2 Employees

- Employee operators are responsible for following the requirements of this program and reporting any damage or needed repairs immediately to their supervisor.
- Operators must meet the physical qualifications, pass a physical, a written examination, understand and be able to use a load chart as well as calculate loads for the crane type operated.
- Employees designated as crane operators are responsible for the entire lift. In addition, crane operators are responsible to:
  - ❖ Make the required inspections,
  - ❖ Ensure that the crane is maintained,
  - ❖ Ensure that all personnel working in the area around the crane are kept clear of all hazards related to crane operations.
  - ❖ Determine the weights, and correct rigging required for loads to be lifted.

3.0 SAFETY

3.1 Personal Protective Equipment

When your employer conducts, a personal protective equipment hazard assessment (as required in Part 33. Personal Protective Equipment), they should include overhead cranes in their review.

An operator and any employee directing a lift must use the PPE required in the area. If the top of the load is lifted to a height greater than 5 feet, then the load is considered an overhead hazard and head protection need to be worn.

4.0 TRAINING

Training of all operators will include the following:

- Capacities of equipment and attachments.
- Purpose, use, and limitation of controls.
- How to make daily checks.
- The energizing sequences, including pneumatic, hydraulic, and electrical sequences.
- Start-up and shutdown procedures.
- Emergency shutdown procedures.

- General operating procedures.
- Safe work practices/procedures for slings.
- All basic signaling procedures, including hand, radio, or telephone signals, where required.
- Knowledge of Overhead and Gantry Cranes, and other applicable.
- Practice in operating the assigned equipment through the mechanical functions necessary to perform the required task.
- The maximum rated capacity of the crane.

Training of all riggers will include the following:

- The Overhead and Gantry Cranes.
- Knowledge of Slings.
- Knowledge of Personal Protective Equipment.
- Maximum capacity of the crane.
- Rigging procedures.
- Company rules and regulations.

5.0 PROCEDURE

5.1 General Requirements

This procedure applies to overhead and gantry cranes, including semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

- **New and existing equipment**. All new overhead and gantry cranes constructed and installed on or after August 31, 1971, shall meet the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes.
- **Modifications.** Cranes may be modified and rated provided such modifications, and the supporting structure is checked thoroughly for the new rated load by a qualified engineer or the equipment manufacturer. The crane shall be tested.
- **Rated load marking.** The rated load of the crane shall be plainly/clearly marked on each side of the crane, and if the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground or floor.
- **Clearance from obstruction.** A minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with Crane Manufacturers Association of America, Inc, Specification No. 61. Where passageways or walkways are provided, obstructions shall not be placed so that safety of personnel will be jeopardized by the motion of the crane.
- **The clearance between parallel cranes.** If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.
- **Designated competent personnel.** Only designated/competent personnel shall be permitted to operate a crane covered by this section. Designated personnel must go through training for a crane

initially, and refresher training every three years, per industry consensus.

- **Fire extinguishers.** Robinson Brothers Construction, Inc.'s CSO shall ensure that operators are familiar with the operation and care of fire extinguishers provided. Please call CSO for training or replacement/inspection of a fire extinguisher.

5.2 Cabs

- **Cab location.** The general arrangement of the cab and the location of control and protective equipment shall be such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions. The cab shall be located to afford a minimum of 3 inches' clearance from all fixed structures within its area of possible movement.
- **Access to the crane.** Access to the cab and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform requiring no step over any gap exceeding 12 inches. Fixed ladders shall be in conformance with the American National Standard Safety Code for Fixed Ladders, ANSI A14.3-1956.
- **Fire extinguisher.** Carbon tetrachloride extinguishers shall not be used.
- **Lighting.** Light in the cab shall be sufficient to enable the operator to see clearly enough to perform his work.

5.3 Guards for Hoisting Ropes

- If hoisting ropes run near enough to other parts to make fouling or chafing possible, guards shall be installed to prevent this condition.
- A guard shall be provided to prevent contact between bridge conductors and hoisting ropes if they could come into contact.
- **Guards for moving parts**. Exposed moving parts such as gears, set screws, projecting keys, chains, chain sprockets, and reciprocating components which might constitute a hazard under normal operating conditions shall be guarded. Guards shall be securely fastened. Each guard shall be capable of supporting without permanent distortion the weight of a 200-pound person unless the guard is located where it is impossible for a person to step on it.

5.4 Brakes

- **Brakes for hoists.** Each independent hoisting unit of a crane shall be equipped with at least one self-setting brake, hereafter referred to as a holding brake, applied directly to the motor shaft or some part of the gear train.
- Each independent hoisting unit of a crane, except worm-geared hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction shall, in addition to a holding brake, be equipped with a controlled braking means to prevent over-speeding.
- **Holding brakes.** Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied. 125 percent when used with a controlled braking means other than mechanical. 100 percent when used in conjunction with a mechanical control braking means. 100 percent each if two holding brakes are provided. Holding brakes on hoists shall have ample thermal capacity for the frequency of operation required by the service. Holding brakes on hoists shall be applied automatically when power is removed. Where necessary holding brakes shall be provided with adjustment means to compensate for wear.

The wearing surface of all holding-brake.

- Drums or discs shall be smooth. Each independent hoisting unit of a crane handling hot metal and having power control braking means shall be equipped with at least two holding brakes.
- **Brakes for trolleys and bridges**. Foot-operated brakes shall not require an applied force of more than 70 pounds to develop manufacturer's rated brake torque. Brakes may be applied by mechanical, electrical, pneumatic, hydraulic, or gravity means. Where necessary brakes shall be provided with adjustment means to compensate for wear. The wearing surface of all brake drums or discs shall be smooth. All foot brake pedals shall be constructed so that the operator's foot will not easily slip off the pedal. Foot- operated brakes shall be equipped with automatic means for positive release when pressure is released from the pedal. Brakes for stopping the motion of the trolley or bridge shall be of sufficient size to stop the trolley or bridge within a distance in feet equal to 10 percent of full load speed in feet per minute when traveling at full speed with full load. If holding brakes are provided on the bridge or trolleys, they shall not prohibit the use of a drift point in the control circuit. Brakes on trolleys and bridges shall have ample thermal capacity for the frequency of operation required by the service to prevent impairment of functions from overheating.
- **Application of trolley brakes.** A drag brake may be applied to hold the trolley in a desired position on the bridge and to eliminate creep with the power off.
- **Application of bridge brakes.** On cab-operated cranes with cab on the trolley, a bridge brake of the holding type shall be required. On all floor, remote and pulpit-operated crane bridge drives, a brake of non-coasting mechanical drive shall be provided.

5.5 Hoisting Equipment

Sheaves. Sheave grooves shall be smooth and free from surface defects which could cause rope damage. Sheaves carrying ropes which can be momentarily unloaded shall be provided with close- fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again. The sheaves in the bottom block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose. Pockets and flanges of sheaves used with hoist chains shall be of such dimensions that the chain does not catch or bind during operation. All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings to meet this requirement.

Ropes. In using hoisting ropes, the crane manufacturer's recommendation shall be followed. The rated load divided by the number of parts of rope shall not exceed 20 percent of the nominal breaking strength of the rope. Socketing shall be done in the manner specified by the manufacturer of the assembly. Rope shall be secured to the drum as follows:

- No less than two wraps of rope shall remain on the drum when the hook is in its extreme low position.
- Rope end shall be anchored by a clamp securely attached to the drum, or by a socket arrangement approved by the crane or rope manufacturer.
- Rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope. Spacing and number of all types of clips shall be in accordance with the clip manufacturer's recommendation. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened.
- Swaged or compressed fittings shall be applied as recommended by the rope or crane manufacturer.
- Wherever exposed to temperatures, at which fiber cores would be damaged, the rope having an independent wire rope or wire strand core, or other temperature-damage resistant core shall be used.

- Replacement rope shall be the same size, grade, and construction as the original rope furnished by the crane manufacturer unless otherwise recommended by a wire rope manufacturer due to actual working condition requirements.
- **Equalizers.** If a load is supported by more than one part of the rope, the tension in the parts shall be equalized.
- **Hooks.** Hooks shall meet the manufacturer's recommendations and shall not be overloaded.

5.6 Warning Device

Except for floor-operated cranes, a gong or other effective warning signal shall be provided for each crane equipped with a power traveling mechanism.

5.7 Inspection

Inspection classification. Initial inspection. Prior to initial use, all new and altered cranes shall be inspected to ensure compliance with the provisions of this policy / procedure.

Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals, in turn, are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

Frequent inspection – Daily to monthly intervals.

****At Robinson Brothers Construction, Inc. this shall be performed prior to each time the crane is operated or at least at monthly intervals. The frequent inspections will be performed only by designated competent operators.*

Periodic inspection – 1 to 12-month intervals.

****At Robinson Brothers Construction, Inc. this shall be performed at 12-month intervals. The periodic inspections will be performed only by qualified crane technicians. This inspection shall be arranged by the organization with administrative control of the crane.*

Frequent inspection. The following items shall be inspected for defects at intervals as specifically indicated, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined, and determination made as to whether they constitute a safety hazard:

- All functional operating mechanisms for maladjustment interfering with proper operation.
- Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems.
- **Hooks with deformation or cracks**. Visual inspection daily, and monthly inspection with a certification record which including's the date of inspection, the signature of the person who performed the inspection and the serial number, or any other identifier, of the hook, inspected. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10< twist from the plane of the unbent hook.
- Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily, and monthly inspection with a certification record which including's the date of inspection, the signature

of the person who performed the inspection and an identifier of the chain which was inspected.

Note: It is the company's responsibility to inform all affected personnel of the non-use of Hoist Chains if they are prohibited.

- Slings, inspect slings and accessories before each use and before placing into storage. Check for visible faults in links and hooks and distortion of fittings.
- All functional operating mechanisms for excessive wear of components. Rope reeving for noncompliance with manufacturer's recommendations.

Periodic inspection. Complete inspections of the crane shall be performed at intervals depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the addition, of the following items. Any deficiencies such as listed shall be carefully examined, and determination made as to whether they constitute a safety hazard:

- Deformed, cracked, or corroded members.
- Loose bolts or rivets.
- Cracked or worn sheaves and drums.
- Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.
- Excessive wear on brake system parts, linings, pawls, and ratchets.
- Load, wind, and other indicators over their full range, for any significant inaccuracies.
- Excessive wear of chain drive sprockets and excessive chain stretch.
- Electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches and push button stations.

Cranes not in regular use. A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be given an inspection conforming with requirements Frequent Inspection before placing in service:

- A crane which has been idle for a period of over 6 months shall be given a complete inspection conforming before placing in service.
- Standby cranes shall be inspected at least semi-annually in accordance with requirements of Frequent Inspection.

5.8 Testing

Operational tests. Prior to initial use, all new and altered cranes shall be tested to ensure compliance with this section including the following functions:

- Hoisting and lowering.
- Trolley travel.
- Bridge travel.
- Limit switches, locking and safety devices.

The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in

increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located so that it will trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.

Rated load test. Test loads shall not be more than 125 percent of the rated load unless otherwise recommended by the manufacturer. The test reports shall be placed on file where readily available to appointed personnel.

5.9 Maintenance

Preventive maintenance. A preventive maintenance program based on the crane manufacturer's recommendations shall be established.

Maintenance policy/procedure. Before adjustments and repairs are started on a crane the following precautions shall be taken:

- The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operations in the area.
- Ensure that the crane is Lockout/Tagout before performing maintenance on cranes.
- All controllers shall be in the off position.
- The main or emergency switch shall be open and locked in the open position.
- Warning or "out of order" signs shall be placed on the crane, also on the floor beneath or on the hook where visible from the floor.
- Where other cranes are in operation on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane.
- After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

Adjustments and repairs. Any unsafe conditions disclosed by the inspection requirements shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel. Adjustments shall be maintained to assure correct functioning of components. The following are examples:

- All functional operating mechanisms.
- Limit switches Control Systems Brakes.
- Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:
  - ❖ Crane hooks showing defects shall be discarded. Repairs by welding or reshaping are not generally recommended. If such repairs are attempted, they shall only be done under competent supervision, and the hook shall be tested to the load requirements.
  - ❖ Load attachment chains and rope slings showing defects.
  - ❖ All critical parts which are cracked, broken, bent, or excessively worn. Pendant control stations shall be kept clean and function labels kept legible.

5.10 Rope Inspection

Running ropes. *A thorough inspection of all ropes shall be made at least once a month and a certification*

record which including's the date of inspection, the signature of the person who performed the inspection and an identifier for the ropes which were inspected shall be kept on file where readily available to appointed personnel. Any deterioration, resulting in appreciable loss of original strength, shall be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard. Some of the conditions that could result in an appreciable loss of strength are the following:

- Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.
- A number of broken outside wires and the degree of distribution or concentration of such broken wires.
- Worn outside wires.
- Corroded or broken wires at end connections.
- Corroded, cracked, bent, worn, or improperly applied end connections. Severe kinking, crushing, cutting, or unstranding.

Other ropes All rope which has been idle for a period of a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is used. This inspection shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope. A certification record shall be available for inspection which including's the date of inspection, the signature of the person who performed the inspection and an identifier for the rope which was inspected.

5.11 Handling the Load

The size of the load. The crane shall not be loaded beyond its rated load except for test purposes.

Attaching the load. The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load. The load shall be attached to the load block hook by means of slings or other approved devices. Care shall be taken to make certain that the sling clears all obstacles.

Moving the load. The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches. Before starting to hoist the following conditions shall be noted:

- Hoist rope shall not be kinked.
- Multiple part lines shall not be twisted around each other.
- The hook shall be brought over the load in such a manner as to prevent swinging. During hoisting, care shall be taken that:
  - ❖ There is no sudden acceleration or deceleration of the moving load. The load does not contact any obstructions.
  - ❖ The employer shall ensure that a procedure for operations near electrical lines is provided before work is started. Robinson Brothers Construction, Inc. requires guidelines of 1910.333(c)(3) lines shall be deenergized or grounded or other protective measures.
  - ❖ Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed. While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling.

- ❖ The employer shall require that the operator avoids carrying loads over people. The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes. The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.
- ❖ When two or more cranes are used to lift a load one qualified responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made. The employer shall ensure that the operator does not leave his position at the controls while the load is suspended. When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

Hoist limit switch. At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified. The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control.

6.0 RECORDKEEPING

The following information is maintained as a result of this process:

- Rated Load Test Records.
- All inspections shall be maintained.
- A log of pre-use inspections should be maintained.
- Initial, monthly, quarterly and annual inspection reports, as well as records of repairs and modifications carried out on cranes in accordance with this Recommended Practice should be maintained and kept readily available for a period of 4 years at an appropriate location.

7.0 REFERENCES

1.	**Documents & External References** www.michigan.gov/documents/cis_wsh_cet0151_91491_7.doc, file:///F:/USRAVs%20Working/2nd%20Set/New%20Set/Overhead%20Gantry%20Crane%20Rigging/Research/CRANE%20PROGRAM%20AND%20SOP.pdf,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

Transmission can be anticipated in the workplace not only from patients to workers in healthcare settings but also among co-workers and between members of the general public and workers in other types of workplaces. This document provides guidance for Robinson Brothers Construction, Inc. employees during a pandemic.

This document is not intended to cover all OSHA standards that may apply. State Plans adopt and enforce their own occupational safety and health standards at www.osha.gov/dcsp/osp.

1.1 Scope

This information is intended for Robinson Brothers Construction, Inc. employees, to ensure that workers believe that their employer provides a safe and healthy workplace, and are more likely to report for work during a pandemic. Clear communication promotes confidence in the employer's ability to protect workers and reduces absenteeism. This program is intended to assist Robinson Brothers Construction, Inc.'s employee's and contractor's

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
None	None.

2.1 Responsibilities

2.1.1 Employer

- Ensures that a pandemic disease plan or disease containment plan shall be developed for the company and a coordinator appointed.
- Understand the differences between seasonal epidemics and worldwide pandemic disease outbreaks,
- Know which job activities may put them at risk for exposure to sources of infection,
- Know what options may be available for working remotely, or utilizing an employer's flexible leave policy when they are sick,
- Good hygiene and appropriate disinfection procedures,
- Ensure personal protective equipment (PPE) is available, and how to wear, use, clean and store it properly,
- Ensure medical services (e.g., vaccination, post-exposure medication) may be available to them, and
- Ensure supervisors will provide updated pandemic-related communications, and where to direct their questions.

3.0 SAFETY

3.1 Risk Assessments

Risk assessments to identify the essential/critical components of our business operation need to be conducted. Recognize that a pandemic includes:

- Healthcare services not being available (they are already full at present with the usual ailments).
- Schools, churches and other public places not being open.
- Borders are partially or fully closed, especially airports, leaving people (our families, employees, business partners, customers, and suppliers) "stranded."
- Essential materials and supplies may be limited due to distribution chains that are affected by the travel restrictions or absentee workers supporting those transportation means.
- Essential services around utilities, food distribution/access, and banking systems may not be at "normal levels"; access to cash flow could be tight.
- People may not be willing to or able to come to work.

4.0 TRAINING

Following the Centers for Disease Control and Prevention (CDC) recommendations training:

- On illness prevention, how to avoid the spread of disease and company policies concerning illness.
- Employers should provide worker training on infection controls, including the importance of avoiding close contact (within 6 feet) with others.
- Employers should provide adequate supplies and ready access to soap and running water, tissues, alcohol-based hand sanitizers and cleaning agents.
- Some worksites may need PPE (e.g., gloves, face shields, and respirators).
- Frequent visual and verbal reminders to workers can improve compliance with hand hygiene practices and thus reduce rates of infection.

Note: Handwashing posters are available from the CDC, at www.cdc.gov/features/handwashing.

5.0 PROCEDURE

5.1 Development Pandemic Disease Plan and Appointment of the Coordinator

Robinson Brothers Construction, Inc. has developed a ***Pandemic Disease Plan*** or ***Disease Containment Plan*** and has designated a Coordinator. Please see Robinson Brothers Construction, Inc. Health and Safety Department for current information.

The workplace coordinator will be responsible for dealing with disease issues and their impact on the workplace, this may include:

- Contacting the local health department
- Health care providers in advance and developing and implementing protocols for response to ill individuals.

5.1.1 Work at Home Considerations

There is a work-at-home and stay-at-home policy when employees are ill or are caring for others. Flexible work policies will be developed as much as possible. Employees are encouraged to stay at home when ill, when having to care for ill family members or when caring for children when schools close, without fear of reprisal. Telecommuting or other work-at-home strategies will be developed. Also, a strategy for the continuation of work operations if a large percentage of personnel become ill.

5.1.2 Sick Leave

Employers may consider providing sick leave so that workers may stay home if they are sick. Flexible leave policies help stop the spread of disease, including to healthy workers.

5.2 Infection Control Measures

Guidelines for infection control are important to clarify the routes of transmission and the ways to interrupt transmission through measures of hygiene. Infection control is an essential component of pandemic management and a component of public health measures. Essential measures include:

- Hand washing and use of hand sanitizers shall be encouraged by Robinson Brothers Construction, Inc. supervision.
- Hand washing facilities, hand sanitizers, tissues, no-touch trash cans, hand soap, disposable towels, and PPE shall be provided by Robinson Brothers Construction, Inc..
- Workers are encouraged to obtain appropriate immunizations to help avoid disease. Granting time off work to obtain the vaccine is considered when vaccines become available in the community.
- Social distancing including increasing the space between employee work areas and decreasing the possibility of contact by limiting large or close contact gatherings will be considered.

Additional examples of infection control measures include:

- Stay at home when you are sick. If possible, stay away from work, school and from running errands.
- You will help others from catching your illness. Cover your coughs and sneeze into a tissue or cough into your shirt sleeve.
- Enhance existing housekeeping service by wiping down and disinfecting work areas (i.e. desktops, keyboards, lunch tables, doorknobs, faucets, hand rails, etc.) frequently.
- Enhance housekeeping services for general public use areas several times throughout the work period.
- Employers may modify the work environment and/or change work practices to provide additional protection to workers and clients. For example, employers may install physical barriers (e.g., clear plastic sneeze guards).
- Employers should select equipment, such as surgical masks and respirators as described below, that will protect workers against infectious diseases to which they may be exposed.

5.3 Implementation, Testing, and Revision of the Plan

The plan and emergency communication strategies will be periodically tested (at least annually) to ensure it is
effective and workable.

Testing the plan will be accomplished by conducting exercises. Exercises range from low stress to full-scale, hands-on drills. A tabletop exercise is the easiest way to begin testing the plan. This type of exercise involves having discussions regarding a scenario that challenges the plan and the decision makers during an emergency.

Communications during a pandemic involves both internal communications and external/customer communications. Internal communication will be provided to employees to educate them about pandemic diseases and measures they can take to be prepared.

Key contacts, a chain of communications and contact numbers for employees and processes for tracking business and employee's status have been developed as described in this section.

Following a pandemic event, the person responsible for implementation of the plan should identify learning opportunities and take action to implement any corrective actions.

5.3.1 Continuous Updates

Provide continuous updates through internal & external communications when a pandemic is imminent:

- Notification to employees of operational changes,
- Provide frequent updates about the pandemic status,
- Provide advisories and alerts as conditions change,
- Ensure vendors and suppliers have available a dedicated communication contact, and
- Monitor local, state, and federal pandemic updates.

Notify key contacts including both customers and suppliers in the event an outbreak has impacted our company's ability to perform services. This procedure also includes notification to customers and suppliers when operations resume.

5.3.2 Higher Risk Work Settings

include those health care workplaces where: infected patients may congregate; clinical specimens are handled or transported, or materials contaminated with blood or infectious wastes are handled. These settings warrant:

- Use of physical barriers to control the spread of infectious disease,
- Worker and client management to promote social distancing, and
- Adequate and appropriate PPE, hygiene and cleaning supplies.

Additional information, including an OSHA Fact Sheet on exposure risks in healthcare workplaces, can be found on OSHA's Publications page: www.osha.gov/publications. Employers and workers can also learn about preparedness for pandemics and other events at OSHA's Emergency Preparedness and Response page: www.osha.gov/SLTC/emergencypreparedness.

Very High & High Exposure Risk	Medium Exposure Risk	Lower Exposure Risk (Caution)
Healthcare workers, particularly those working with known or suspected	Workers with high-frequency interaction with the general public (e.g., those working in schools, restaurants and retail establishments, travel and mass transit, or	Workers who have minimal contact with the general public and other coworkers

pandemic patients.	other crowded environments).	(e.g., office workers).

6.0 RECORDKEEPING

The following information is maintained as a result of this process:

- Documentation of all training is required,
- Risk Assessments,
- Testing, and
- Revision of this Plan.

7.0 REFERENCES

1.	**Documents & External References** https://www.osha.gov/Publications/OSHAFS-3747.pdf, http://www.thehillisgroupllc.com/P&P/Pandemic%20Response%200022.pdf,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

Robinson Brothers Construction, Inc.		
PERSONAL PROTECTIVE EQUIPMENT		
Version: 1.0	**Date Approved:** 28 November 2016	Health, and Safety Environmental **CSO:** Joe Bergren

TABLE OF CONTENT

AUTHORIZATION

APPROVED BY:
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1.0 PURPOSE

The purpose of the Personal Protective Equipment section is to set forth the procedures for the use, care, and maintenance of personal protective equipment required to be used by employees for the prevention of injuries.

1.1 SCOPE

Applies to all Robinson Brothers Construction, Inc. employees. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Foot Protection	Equipment designed to provide protection to the feet and toes during exposure to situations with the potential for foot injuries such as falling or rolling objects, chemical or liquid exposures, piercing objects through the sole or uppers, and/or where the employee's feet are exposed to electrical hazards.
Hand Protection	Equipment designed to provide protection to the hands during exposures to potential hazards such as sharp objects, abrasive surfaces, temperature extremes and chemical contact. Hand protection is selected based upon the hazard and performance characteristics of the gloves.
Hazard Assessment	The process utilized to identify hazards in the workplace and to select the appropriate Personal Protective Equipment to guard people against potential hazards (see Guidelines for Selection of Personal Protective Equipment).
Head Protection	Equipment designed to provide protection to the head during exposure to potential hazards such as falling objects, striking against low hanging objects, or electrical hazards.
Hearing Protection	Equipment designed to provide protection to an individual's hearing during exposure to high noise levels.

2.1 Responsibilities

2.1.1 HSE Manager

- Assists in the selection of appropriate PPE. If a task exposes an employee to hazards which cannot be eliminated through engineering or administrative controls, the HSE Manager assists the supervisor and project manager to identify and select PPE suitable for the specific task performed, conditions present, and frequency and duration of exposure. Employees need to give feedback to the supervisor about the fit, comfort, and suitability of the PPE being selected. Employees are provided reasons for selection of PPE.
- Assists supervisor and site managers in assuring all PPE obtained meets regulatory and this procedure's requirements.
- Performs Worksite Hazard Assessments - The hazard assessment must indicate a determination if hazards are present or are likely to be present, which necessitate the use of PPE. Sources of hazards include, but are not limited to: hazards from impact/motion, high/low temperatures, chemicals, materials, radiation, falling objects, sharp objects, rolling or pinching objects, electrical hazards, and workplace layout.
- Certifies in writing the tasks evaluated, hazards found and PPE required to protect employees against hazards and ensures exposed employees are made aware of hazards and required PPE before they are assigned to the hazardous task. Certificate shall include certifier's name, signature, dates and identification of assessment documents.

2.1.2 Managers and Supervisors

- Supervisors and managers shall regularly monitor employees for correct use and care of PPE, and obtain follow-up training if required to ensure each employee has adequate skill, knowledge, and ability to use PPE.
- Supervisors and managers shall enforce PPE safety rules following the guidance of the Robinson Brothers Construction, Inc. progressive disciplinary procedures and ensure Required PPE Poster is posted properly.

2.1.3 Employees

- Complying with the correct use and care of PPE.
- Reporting changes in exposure to hazardous conditions that might require a follow-up assessment of the task for PPE.
- Reporting and replacing defective PPE, which shall not be used.
- Wearing of required PPE is a condition of employment.

3.0 SAFETY

Employee-owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment. All personal protective equipment shall be of safe design and construction for the work to be performed.

The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall:

- Ensure Hazard assessment for equipment selection
- Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment
- Communicate selection decisions to each affected employee, and
- Select PPE that properly fits each affected employee

Note: Non-mandatory Appendix B contains an example of procedures that would comply with the requirement for a hazard assessment.

The employer shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment; and, which identifies the document as a certification of hazard assessment.

Defective and damaged equipment. Defective or damaged personal protective equipment shall not be used.
Hazard assessment and equipment selection.

4.0 TRAINING

Each employee who requires PPE shall be properly trained. Training shall include:

- When PPE is necessary.
- What PPE is necessary.
- How to properly don, doff, adjust and wear PPE.
- The limitations of PPE.
- How to maintain PPE in a sanitary and reliable condition.

4.1 Retraining

Retraining is required when:

- The workplace changes, making the previous training obsolete.
- The type of PPE changes.
- When the employee demonstrates lack of use, improper use, or insufficient skill or understanding in PPE selection, necessity use, and limitations.

5.0 PROCEDURE

5.1 General

Employee owned equipment is NOT permitted, except for safety toe footwear and prescription safety glasses. The Robinson Brothers Construction, Inc. is still responsible for the assurance of its adequacy, maintenance and sanitation of those two items.

All PPE issued by Robinson Brothers Construction, Inc. shall be at no cost to the employee and PPE shall be used and maintained in a sanitary and reliable condition. All employees will know and follow the procedures outlined in this Program.

5.2 Eye Protection

Employees must use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids or chemical gases or vapors. Eye and Face PPE must comply with ANSI Standard Z87.1---2003 (Z87+), *Occupational and Educational Personal Eye and Face Protective Devices.*

5.2.1 Safety Glasses

Safety glasses, with side shields, that meet ANSI Z87.1-2003 standards with "high Impact lenses" are required to be worn by all employees, subcontractors, and visitors while on Robinson Brothers Construction, Inc.. property, at all times, as described below:

- At field locations, in shops and warehouses, except in approved, designated, striped safety zones.
- In all yard work zones or by everyone when in the vicinity of loading or unloading equipment, performing mechanic or maintenance work, test stand operations, operating equipment such as forklifts, welding, or any type of work which has the potential to inflict an eye injury.
- In any office, restroom, or any other building while performing any type of work where a potential eye injury may be present.
- Visitors will be provided with visitor glasses. In the absence of approved prescription safety glasses, "Over the glass" type safety glasses or goggles, must be worn over the non-safety glasses until approved prescription safety glasses are obtained.
- Workers assisting welders must wear absorbent safety glasses that protect the wearer from ultra-violet (UV) and/or infrared rays (IR).
- Dark shaded lens (sunglasses) darker than a # 1 shade is prohibited to be worn indoors unless welding or assisting a welder.
- A doctor must support "exceptions for medical reasons" in writing to exempt safety eyewear requirements.

a. Safety glasses are not required:

- Inside offices.
- Parking lots when traveling from vehicles to and from office buildings by way of main doors that do not pass through shops.

b. Goggles

- Chemical splash proof goggles shall be worn when handling or mixing liquid chemicals, solvents, paints, etc., and/or as recommended on the Material Safety Data Sheet of the material being handled.
- Dust proof goggles shall be worn when blowing equipment down with air or while performing other jobs where safety glasses are not adequate to prevent airborne particles from entering the openings around the lenses and side shields.

c. Face Shields

Full face shields shall be worn over safety glasses when operating hand held or stationery grinders with abrasive or wire wheels, while chipping paint or concrete or, performing jobs where there is the potential for flying objects striking the face and safety glasses or goggles would not provide adequate protection.

5.3 Head Protection

Employees must wear protective helmets when working in areas where there is a potential for injury to the head from employee initiated impact or impact from falling or other moving objects. Helmets must comply with ANSI Standard Z89.1---1997 Class E, *American National Standard for Industrial Head Protection* for Type II head protection or be equally effective.

- Employees must wear protective helmets when working in areas where there is a potential for injury to the head from falling objects.
- Hardhats are to be worn at all field, shop and warehouse locations, or where deemed necessary as per each location's PPE Hazard Assessment.
- Hardhats will not be altered in any way.
- Do not paint or apply unauthorized stickers, name plates, etc.
- Do not drill, cut, bend, or apply heat.
- Do not alter the suspension system.
- Hardhats will be inspected by the employee regularly for cracks, chips, scratches, signs of heat exposure (sun cracks), etc.
- Defective hardhats will be replaced immediately.
- Hardhats shall not be placed in rear windows of vehicles where they will be exposed to the sun or become projectiles during an accident.
- A supply of hardhats must be made available to visitors.
- The company shall provide hardhats.
- Employees will be trained in the use, care and maintenance of head protection equipment

5.4 Hearing Protection

Hearing protection is required to be worn by all employees, subcontractors, and visitors while in posted "High Noise" areas. Refer to the Robinson Brothers Construction, Inc. Hearing Conservation Program for more information.

Warning signs will be posted in areas known or suspected to have noise levels exceeding 85 dBA either constantly or intermittently.

When signs are not posted, employees shall wear hearing protection when noise caused by machinery, tools, etc., prevents normal conversations to be heard clearly.

5.4.1 Rule of Thumb

If you have to yell to be heard, hearing protection is required:

a. Types

- Molded Inserts (ear plugs)
- Canal Caps (head band type)
- Muff, either headband or hard hat mounted Earmuffs and earplugs shall be provided to the employee in sizes and configurations that will be comfortable to the employee.

b. Care and Maintenance

- Inspect hearing protection prior to each use.
- Hearing protection must be kept clean to prevent ear infections.
- Most earplugs used today are disposable and must be discarded when they become dirty, greasy, or cracked.

- Earmuffs that have deteriorated foam inserts, cracked seals or are defective must be replaced.

c. Fit

- Due to individual differences, not everyone can wear the same type of hearing protection. A variety of styles may have to be tried before one is found to be comfortable and provide adequate protection.

5.5 Hand Protection

a. Gloves

- Gloves are required to be worn when performing work, which may expose the hands to extreme temperatures, cuts and abrasions, or exposure to chemicals.
- Welding: Welding gloves made of leather or other heat resistant materials shall be worn when performing arc welding or oxy/gas cutting.
- Chemical: Impervious (chemical resistant) gloves shall be worn when handling chemicals that specify gloves as personal protection equipment when handling.
- Refer to the specific chemical's Material Safety Data Sheet for the correct glove type.
- Persons assigned to working with chemicals, i.e., solvent vats, shall be issued their own individual gloves for hygiene purposes.
- Leather: Leather gloves should be worn when working with sharp materials or when handling rigging equipment.

- Cloth: Cloth gloves should be worn when handling objects or materials, which could cause blisters, splinters, cuts, etc.
- Heat Resistant: Heat resistant gloves shall be worn when handling hot bearings, races, or other materials or objects that have been heated beyond ambient temperatures.

a. Insulated

Insulated gloves shall be worn to prevent frostbite in extreme cold climates. Glove Inspections:

- Gloves shall be inspected before each use for holes, tears, and worn areas.
- Chemical gloves shall be periodically air tested for pinholes by twisting the cuff tightly, apply low air pressure to expand the glove, and then submersing in water to check for bubbles.
- Defective gloves shall be discarded immediately. Exception: machinists are exempted from wearing gloves while working with rotating machinery.

5.6 Foot Protection

Safety footwear shall be worn by all employees with regularly assigned duties at field locations, in shops and warehouses.

- Office workers and visitors who enter these areas on an infrequent basis will not be required to wear foot protection provided they stay clear of the work being performed.
- If required to be in the close proximity of the work, the work will be stopped while visiting the area or safety footwear will be worn.
- Shops, Field Locations, Warehouses and Parts Departments: Leather or equivalent boots, either lace up or pull up, shall be worn.
- The boot must provide ankle protection and have soles designed to protect from punctures with defined heels for climbing ladders.
- Metatarsal guards will be worn when duties present a hazard of equipment or material crushing the foot.
- All safety footwear must meet ANSI Z41---1999 standards.
- Client locations may require safety footwear to be worn by everyone; check with the local supervisor for client requirements before visiting field locations.

5.7 Fall Protection

Personal fall protection is required when performing certain elevated jobs in excess of six feet. Consult the Robinson Brothers Construction, Inc. Fall Protection Program.

5.8 Electrical Protection

Consult the Robinson Brothers Construction, Inc.'s Electrical Safety Program.

5.9 Worksite Hazard Assessment

During a hazard assessment, the following sample hazard sources will be identified:

- High or low temperatures; Chemical exposures (use SDS for guidance)
- Flying particles, molten metal or other eye, face, or skin hazards
- Falling objects or potential for dropping objects employee falling from a height of 6’ or more
- Sharp objects
- Rolling or pinching that could crush the hands or feet
- Electrical hazards

Where these hazards could cause injury to employees, personal protective equipment must be selected to substantially eliminate the injury potential. Employees will be notified for the selection and reason.

The results of this assessment shall be communicated to each affected employee and kept at the local office.

Selected/identified PPE shall be fitted to each affected employee. Exemptions for use of PPE must be supported by the PPE hazard assessment.

5.10 Monitoring

Supervisors and site managers monitor worksite tasks for changes in, or the introduction of new hazards. If new hazards are discovered, they advise the HSE Manager who then conducts a hazard assessment for appropriate PPE. The HSE Manager monitors the effectiveness of the PPE Procedure and makes recommendations to management to improve the procedure.

6.0 RECORDKEEPING

Training shall be documented and records kept at the local office. The training documentation shall

include:

- Name of employee(s) trained,
- The dates of training, and
- The training subject.

7.0 REFERENCES

1.	**Documents & External References** OSHA CFR (29) 1910.133(b)(1)(ii), ANSI Z87.1-2003, Occupational and Educational Personal Eye and Face Protection Devices, Scales NW, Inc. PPE Policy April 2014, 29 CFR 1910.95, Occupational Noise Exposure, ASTM F-2412-2005, "Standard Test Methods for Foot Protection," ASTM F-2413-2005, "Standard Specification for Performance Requirements for Protective Footwear, Electrical Safety Program, Personal Protect Equipment Guide, Appendix A OSHA Interpretation Document, **CFR 29**, 1910.132, Occupational Safety and Health Standards, Subpart(I), Personal Protective Equipment, General requirements.

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document for Document Control purposes.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: PPE Matrix (Example)

PPE	Task	Normal Cleanup Activities	Working in Wet Conditions	Working with Chain Saws	Working Near/Over Water	Working at Heights Over 6 ft.	Working Near Loud Noise
Head	**Hard Hat**	x	x	x	x	x	x
Eyes	**Safety Glasses**			x	x	x	x
	Safety Goggles		x				
Face	**Face Shield**			x			
Ears	**Hearing Protection**			x			x
Hands	**Work Gloves**	x		x	x	x	x
	Latex/Rubber Gloves		x				
Body	**Hi-Visibility Garment**	x	x	x	x	x	x
	Impervious Body Suit		x				
	PFD and Life Ring				x		
	Chaps			x			
	Fall Protection					x	
Feet	**Steel Toe Boots**	x		x	x	x	x
	Waterproof Boots		x				

Other PPE	**Workboat/Skiff**				x		

Appendix 2: PPE Hazard Assessment Certification Form

PPE Hazard Assessment Form

Building: _____ Date: _____

Location: _____ Prepared By: _____

Job Task: _____

Does the job task present an occupational exposure to:

Eye Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Dust				
Heat				
Cold				
Impact				
Light/Radiation				

Face Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact				
Heat				
Cold				
Light/Radiation				

Head Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact				
Heat				
Cold				
Light/Radiation				
Electrical Shock				

Hand Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact/Punctures				
Heat				
Cold				
Vibration				
Electrical Shock				
Cuts/Abrasions				

Foot Hazards	Yes	No	Hazard Description	Recommended PPE
Chemicals				
Impact/Punctures				
Heat				
Cold				
Vibration				
Electrical Shock				
Compression				
Electrostatic Build-up				

Respiratory Hazards	Yes	No	Hazard Description	Recommended PPE
Fumes				
Mists				
Dusts				
Vapors				
Lack of Oxygen				
Particles				
Heat/Cold				

Noise Hazards	Yes	No	Hazard Description	Recommended PPE
Impact Noise >140 dBA				
Continuous Noise >85 dBA				

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to ensure that all affected Robinson Brothers Construction, Inc. employees are protected from exposure to respiratory hazards.

1.1 Scope

This program applies to all Robinson Brothers Construction, Inc. employees whose job responsibilities require the use of respiratory protection based on their exposure to a hazardous environment. Also, during normal work operations and during some non-routine or emergency operations.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Air-Purifying Respirator	A respirator with an air-purifying filter, cartridge, or canister capable of removing specific air contaminants by passing ambient air through the air-purifying element.
Assigned Protection Factor (APF)	The minimum expected workplace level of respiratory protection provided by a properly functioning respirator.
Respirator Cartridge	A container with a filter, sorbent medium, or combination of these items that removes specific contaminants (particulates, gases, and/or vapors) from air passed through the container.
Dust Mask	A mask that is not designed as a filtering face piece and is not certified by NIOSH for use as a respirator. The user is not required to participate in the NIH RPP.
Employee Exposure	Exposure to a concentration of an airborne contaminant that would occur if the employee were not using a respirator.
End-Of-Service-Life Indicator (ESLI)	A system that warns a respirator user of the approach of the end of adequate respiratory protection (i.e., a sorbent media is approaching saturation).
Filter	A respirator component used to remove particulates from inspired air.
Fit Factor	A quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
Fit Test	A qualitative or quantitative evaluation of the air seal between the respirator and an individual's face.

2.1 Responsibilities

All Employees shall follow the requirements of the Respiratory Protection Program.

2.1.1 Management

- Implement the requirements of this program.
- Provide a selection of respirators as required.
- Enforce all provisions of this program.
- Appoint a specific designated individual to conduct the respiratory protection program.

2.1.2 Program Administrator

Each facility or company will designate a program administrator who is qualified by appropriate training or experience that is equivalent with the complexity of the program. They must be able to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness. Duties are as followed:

- Review sanitation/storage procedures.
- Ensure respirators are properly, stored, inspected and maintained.
- Monitor compliance for this program.
- Provide training for affected employees.
- Review compliance and ensure monthly inspection of all respirators.
- Provide respirator fit testing.

3.0 SAFETY

3.1 Respiratory Protection Safety Procedures

1. Only authorized and trained Employees may use Respirators. Those Employees may use only the Respirator that they have been trained on and properly fitted to use.
2. Only Physically Qualified Employees may be trained and authorized to use Respirators. A pre-authorization and annual certification by a qualified physician will be required and maintained. Any changes in an Employees health or physical characteristics will be reported to the Occupational Health Department and will be evaluated by a qualified physician.
3. Only the proper prescribed respirator or self contained breathing apparatus (SCBA) may be used for the job or work environment. Air cleansing respirators may be worn in work environments when oxygen levels are between 19.5 percent to 23.5 percent and when the appropriate air cleansing canister, as determined by the Manufacturer and approved by the National Institute for Occupational Health (NIOSH) or the Mine Safety & Health Administration (MSHA), for the known hazardous substance is used. SCBA's will be worn in oxygen deficient and oxygen rich environments (below 19.5 percent or above 23.5 percent oxygen).
4. Employees working in environments where a sudden release of a hazardous substance is likely, will wear an appropriate respirator for that hazardous substance (example: Employees working in an ammonia compressor room will have an ammonia APR respirator on their person.).
5. Only SCBA's will be used in oxygen deficient environments, environments with an unknown hazardous substance or unknown quantity of a known hazardous substance or any environment that is determined "Immediately Dangerous to Life or Health" (IDLH).

6. Employees with respirators loaned on "permanent check out" will be responsible for the sanitation, proper storage and security. Respirators damaged by normal wear will be repaired or replaced by the Company when returned.
7. The last Employee using a respirator and/or SCBA that are available for general use will be responsible for proper storage and sanitation. Monthly and after each use, all respirators will be inspected with documentation to assure its availability for use.
8. All respirators will be located in a clean, convenient and sanitary location.
9. In the event that Employees must enter a confined space, work in environments with hazardous substances that would be dangerous to life or health should an RPE fail (a SCBA is required in this environment), and/or conduct a hazardous material (HAZMAT) entry, a "buddy system" detail will be used with a Safety Watchman with constant voice, visual or signal line communication. Employees will follow the established Emergency Response Program and/or Confined Space Entry Program when applicable.
10. Management will establish and maintain surveillance of jobs and work place conditions and degree of Employee exposure or stress to maintain the proper procedures and to provide the necessary RPE.
11. Management will establish and maintain safe operation procedures for the safe use of RPE with strict enforcement and disciplinary action for failure to follow all general and specific safety rules. Standard Operation Procedures for General RPE use will be maintained as an attachment to the Respiratory Protection Program and Standard Operation Procedures for RPE use under emergency response situations will be maintained as an attachment to the Emergency Response Program.

4.0 TRAINING

Effective training for employees who are required to use respirators is essential. The training must be comprehensive, understandable, and recur annually, and more often if necessary. Training will be provided prior to requiring the employee to use a respirator in the workplace. The training shall ensure that each employee can demonstrate knowledge of at least the following:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator,
- Limitations and capabilities of the respirator,
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions,
- How to inspect, put on and remove, use, and check the seals of the respirator,
- What the procedures are for maintenance and storage of the respirator,
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators, and
- The general requirements of this program.

4.1.1 Retraining shall be conducted annually and when:

- Changes in the workplace or the type of respirator render previous training obsolete
- Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill, and

- Any other situation arises in which retraining appears necessary to ensure safe respirator use

Training will be conducted by instructors certified by _____. Training is divided into the following sections:

4.1.2 Classroom Instruction

- Overview of the Company Respiratory Protection Program & OSHA Standard,
- Respiratory Protection Safety Procedures,
- Respirator Selection,
- Respirator Operation and Use,
- Why the respirator is necessary,
- How improper fit, usage, or maintenance can compromise the protective effect,
- Limitations and capabilities of the respirator,
- How to use the respirator effectively in emergency situations, including respirator malfunctions,
- How to inspect, put on and remove, use, and check the seals of the respirator,
- What the procedures are for maintenance and storage of the respirator,
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators, and
- Change out schedule and procedure for air purifying respirators.

4.2 Fit Testing

4.2.1 Hands-on Respirator Training

- Respirator Inspection,
- Respirator cleaning and sanitizing,
- Record Keeping,
- Respirator Storage,
- Respirator Fit Check,
- Emergencies.

5.0 PROCEDURE

5.1 Voluntary Use of Respirators is Prohibited

OSHA requires that voluntary use of respirators, when not required by the company, must be controlled as strictly as under required circumstances. To prevent violations of the Respiratory Protection Standard Employees are not allowed voluntary use of their own or company supplied respirators of any type.

Exception: Employees whose only use of respirators involves the voluntary use of filtering (non-sealing) face pieces (dust masks).

5.2 Program Evaluation

Evaluations of the workplace are necessary to ensure that the written respiratory protection program is being properly implemented, this includes consulting with employees to ensure that they are using the respirators properly. Evaluations shall be conducted as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective Program evaluation will include discussions with employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance),
- Appropriate respirator selection for the hazards to which the employee is exposed,
- Proper respirator use under the workplace conditions the employee encounters, and
- Proper respirator maintenance.

5.3 Respirator User Policies

Adherence to the following guidelines will help ensure the proper and safe use of respiratory equipment:

- Any employees that are potentially exposed to airborne contaminants must wear respiratory protection.
- Wear only the respirator you have been instructed to use.
- Wear the correct respirator for the particular hazard. For example, some situations, such as chemical spills or other emergencies, may require a higher level of protection than your respirator can handle. Also, the proper cartridge must be matched to the hazard (a cartridge designed for dusts and mists will not provide protection for chemical vapors)
- Check the respirator for a good fit before each use. Positive and negative fit checks should be conducted.
- Check the respirator for deterioration before and after use. Do not use a defective respirator.
- Recognize indications that cartridges and canisters are at their end of service. If in doubt, change the cartridges or canisters before using the respirator.
- Practice moving and working while wearing the respirator so that you can get used to it.
- Clean the respirator after each use, thoroughly dry it and place the cleaned respirator in a sealable plastic bag.
- Store respirators carefully in a protected location away from excessive heat, light, and chemicals.

5.4 Selection of Respirators

The Company has evaluated the respiratory hazard(s) in each workplace, identified relevant workplace and user factors and has based respirator selection on these factors. Also included are estimates of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. This selection has included appropriate protective respirators for use in IDLH atmospheres, and has limited the selection and use of air-purifying respirators. All selected respirators are NIOSH-certified.

Filter Classifications - These classifications are marked on the filter or filter package:

a. **N-Series:** Not Oil Resistant

- Approved for non-oil particulate contaminants
- Examples: dust, fumes, mists not containing oil

b. R-Series: Oil Resistant

- Approved for all particulate contaminants, including those containing oil
- Examples: dusts, mists, fumes
- Time restriction of 8 hours when oils are present

c. P-Series: Oil Proof

- Approved for all particulate contaminants including those containing oil
- Examples: dust, fumes, mists
- See Manufacturer's time use restrictions on packaging

5.5 Respirators for IDLH Atmospheres

- The following respirators will be used in IDLH atmospheres:
- A full-face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
- A combination full face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
- Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

5.6 Respirators for Atmospheres that are not IDLH

The respirators selected shall be adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations. The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

5.6.1 Identification of Filters & Cartridges

All filters and cartridges shall be labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible. A change out schedule for filters and canisters has been developed to ensure these elements of the respirators remain effective.

5.6.2 Respirator Filter & Canister Replacement

An important part of the Respiratory Protection Program includes identifying the useful life of canisters and filters used on air-purifying respirators. Each filter and canister shall be equipped with an *End-of-Service-Life Indicator (ESLI)* certified by NIOSH for the contaminant; or

If there is no ESLI appropriate for conditions a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life.

5.6.3 Filter & Cartridge Change Schedule

Stock of spare filers and cartridges shall be maintained to allow immediate change when required or desired by the employee.

a. **Cartridges shall be changed** based on the most limiting factor below:

- Prior to expiration date.
- Manufacturer's recommendations for use and environment.
- After each use.
- When requested by employee.
- When contaminate odor is detected.
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally.
- Cartridges shall remain in their original sealed packages until needed for immediate use.

b. **Filters shall be changed** based on the most limiting factor below:

- Prior to expiration date
- Manufactures recommendations for the specific use and environment
- When requested by employee
- When contaminate odor is detected
- When restriction to air flow has occurred as evidenced by increase effort by user to breathe normally
- When discoloring of the filter media is evident
- Filters shall remain in their original sealed package until needed for immediate use.

5.7 Respiratory Protection Schedule by Job and Working Condition

The Company maintains a Respiratory Protection Schedule by Job and Working Condition. This schedule is provided to each authorized and trained employee. The Schedule provides the following information:

- Job/Working Conditions
- Work Location
- Hazards Present
- Type of Respirator or SCBA Required
- Type of Filter/Canister Required
- Location of Respirator or SCBA
- Filter/Cartridge change out schedule

The schedule will be reviewed and updated at least annually and whenever any changes are made in the work environments, machinery, equipment, or processes or if respirator different respirator models are introduced or existing models are removed.

5.7.1 Permanent Respirator Schedule Assignments

Each person who engages in welding will have their own company provided dust-mist-fume filter APR. This respirator will be worn during all welding operations.

5.8 Assigned Protection Factors

No respirator can provide 100% effectiveness. OSHA has implemented Assigned Protection Factors (APFs) for various types of respirators. The purpose of APFs is to ensure use of respirators does not cause over-exposure to specific contaminants. Maximum permissible exposure levels (PEL) are generally based on specific concentrations over an 8-hour daily period without using a respirator. As an example, if a respirator has a 90% effectiveness, then a respirator wearer would reach the maximum permissible exposure level in 10 hours ***IF*** the atmospheric conditions were 10 times the PEL.

Our company selects respirators by comparing the exposure level and the maximum concentration of the contaminant in which a particular type of respirator can be used. Known as the Maximum Use Concentration or MUC, this is generally determined by multiplying the respirator's APF by the contaminant's exposure limit. If the level of contaminant is expected to exceed the MUC, the company will select a respirator with a higher APF.

Table of Assigned Protection Factors		
	Operating mode	**Assigned Protection Factors**
i. Air Purifying Respirators [Particulate[b] only][c]:		
Filtering facepiece disposable[d]	Negative Pressure	([d])
Facepiece, half [e]	Negative Pressure	10
Facepiece, full	Negative Pressure	100
Facepiece, half	Powered air-purifying respirators	50
Facepiece, full	Powered air-purifying respirators	1000
Helmet/hood	Powered air-purifying respirators	1000
Facepiece, loose-fitting	Powered air-purifying respirators	25
ii. Atmosphere supplying respirators [particulate, gases and vapors[f]]:		
1. Air-Line Respirator:		
Facepiece, half	Demand	10
Facepiece, half	Continuous Flow	50
Facepiece, half	Pressure Demand	50
Facepiece, full	Demand	100
Facepiece, full	Continuous Flow	1000
Facepiece, full	Pressure Demand	1000
Helmet/hood	Continuous Flow	1000
Facepiece, loose-fitting	Continuous Flow	25

Suit	Continuous Flow	([g])
2. Self-Contained Breathing Apparatus (SCBA):		
Facepiece, full	Demand	[h]100
Facepiece, full	Pressure Demand	[i]10,000
Facepiece, full	Demand, Recirculating	[h]100
Facepiece, full	Positive Pressure Recirculating	[i]10,000
iii. Combination Respirators:		
Any combination of air-purifying and atmosphere-supplying respirators	Assigned protection factor for type and mode of operation as listed above.	

[b] Air purifying respirators with APF <100 must be equipped with particulate filters that are at least 95 percent efficient. Air purifying respirators with APF = 100 must be equipped with particulate filters that are at least 99 percent efficient. Air purifying respirators with APFs >100 must be equipped with particulate filters that are at least 99.97 percent efficient.

[c] The licensee may apply to the Commission for the use of an APF greater than 1 for sorbent cartridges as protection against airborne radioactive gases and vapors (e.g., radioiodine).

[d] Licensees may permit individuals to use this type of respirator who have not been medically screened or fit tested on the device provided that no credit be taken for their use in estimating intake or dose. It is also recognized that it is difficult to perform an effective positive or negative pressure pre-use user seal check on this type of device. All other respiratory protection program requirements listed in § 20.1703 apply. An assigned protection factor has not been assigned for these devices. However, an APF equal to 10 may be used if the licensee can demonstrate a fit factor of at least 100 by use of a validated or evaluated, qualitative or quantitative fit test.

[e] Under-chin type only. No distinction is made in this Appendix between elastomeric half-masks with replaceable cartridges and those designed with the filter medium as an integral part of the facepiece (e.g., disposable or reusable disposable). Both types are acceptable so long as the seal area of the latter contains some substantial type of seal-enhancing material such as rubber or plastic, the two or more suspension straps are adjustable, the filter medium is at least 95 percent efficient and all other requirements of this Part are met.

[f] The assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.

[g] No NIOSH approval schedule is currently available for atmosphere supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met (i.e., § 20.1703).

[h] The licensee should implement institutional controls to assure that these devices are not used in areas immediately dangerous to life or health (IDLH).

[i] This type of respirator may be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure such as

skin absorption shall be taken into account in these circumstances. This device may not be used by any individual who experiences perceptible outward leakage of breathing gas while wearing the device.

5.9 Physical and Medical Qualifications

Records of medical evaluations must be retained and made available in accordance with 29 CFR 1910.1020.

5.9.1 Medical Evaluation Required

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee. The company shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

5.9.2 Medical Evaluation Procedures

The employee will be provided a medical questionnaire by the designated Occupational Health Care Provider.

5.9.3 Follow-Up Medical Examination

The company shall ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions in Part B of the questionnaire or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the Physician deems necessary to make a final determination.

Note: See Questionnaire at https://www.osha.gov/Publications/OSHA3789info.pdf

5.9.4 Administration of The Medical Questionnaire and Examinations

The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire shall be administered in a manner that ensures that the employee understands the content. The company shall provide the employee with an opportunity to discuss the questionnaire and examination results with the Physician.

5.9.5 Supplemental Information for The Physician

The following information must be provided to the Physician before the Physician makes a recommendation concerning an employee's ability to use a respirator:

- The type and weight of the respirator to be used by the employee,
- The duration and frequency of respirator use (including use for rescue and escape),
- The expected physical work effort,
- Additional protective clothing and equipment to be worn,
- Temperature and humidity extremes that may be encountered,
- Any supplemental information provided previously to the Physician regarding an employee need not be provided for a subsequent medical evaluation if the information and the Physician remain the same, and

- The Company has provided the Physician with a copy of the written respiratory protection program and a copy of the OSHA Standard 1910.134

5.9.6 Medical Determination

In determining the employee's ability to use a respirator, the Company shall:

- Obtain a written recommendation regarding the employee's ability to use the respirator from the Physician. The recommendation shall provide only the following information:
  - ❖ Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator.
  - ❖ The need, if any, for follow-up medical evaluations.
  - ❖ A statement that the Physician has provided the employee with a copy of the Physician's written recommendation.
  - ❖ If the respirator is a negative pressure respirator and the Physician finds a medical condition that may place the employee's health at increased risk if the respirator is used, the Company shall provide a APR if the Physician's medical evaluation finds that the employee can use such a respirator; if a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the Company is no longer required to provide a APR.

5.9.7 Additional Medical Evaluations

At a minimum, the company shall provide additional medical evaluations that comply with the requirements of this section if:

- An employee reports medical signs or symptoms that are related to ability to use a respirator,
- A Physician, supervisor, or the respirator program administrator informs the company that an employee needs to be reevaluated,
- Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicates a need for employee reevaluation, and
- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature) that may result in a substantial increase in the physiological burden placed on an employee.

5.10 Respirator Fit Testing

Before an employee is required to use any respirator with a negative or positive pressure tight-fitting face piece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used. The company shall ensure that an employee using a tight-fitting face piece respirator is fit tested prior to initial use of the respirator, whenever a different respirator face piece (size, style, model or make) is used, and at least annually thereafter

The company has established a record of the qualitative and quantitative fit tests administered to employees including:

- The name or identification of the employee tested.
- Type of fit test performed.

- Specific make, model, style, and size of respirator tested.
- Date of test.
- The pass/fail results for ***Qualitative Fit Test*** (QLFT) or the fit factor and strip chart recording or other recording of the test results for ***Quantitative Fit Test*** (QNFT).

Additional fit tests will be conducted whenever the employee reports, or the company, physician, supervisor, or program administrator makes visual observations of, changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.

If after passing a QLFT or QNFT, the employee notifies the Company, program administrator, supervisor, or Physician that the fit of the respirator is unacceptable, the employee shall be given a reasonable opportunity to select a different respirator face piece and to be retested.

5.10.1 Types of Fit Tests

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol. The OSHA-accepted QLFT and QNFT protocols and procedures are contained in Appendix A of OSHA Standard 1910.134.

- QLFT may only be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.
- If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fitting half face pieces, or equal to or greater than 500 for tight-fitting full face pieces, the QNFT has been passed with that respirator.
- Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.
- Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user's actual face piece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator face piece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator face piece.
- Quantitative fit testing of these respirators shall be accomplished by modifying the face piece to allow sampling inside the face piece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate face piece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the face piece.
- Any modifications to the respirator face piece for fit testing shall be completely removed, and the face piece restored to NIOSH approved configuration, before that face piece can be used in the workplace.

Fit test records shall be retained for respirator users until the next fit test is administered. Written materials required to be retained shall be made available upon request to affected employees.

5.11 Respirator Operation and Use

Respirators will only be used following the respiratory protection safety procedures established in this program. The Operations and Use Manuals for each type of respirator will be maintained by the Program Administrator and be available to all qualified users.

Surveillance by the direct supervisor shall be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the company shall reevaluate the continued effectiveness of the respirator.

For continued protection of respirator users, the following general use rules apply:

- Users shall not remove respirators while in a hazardous environment.
- Respirators are to be stored in sealed containers out of harmful atmospheres.
- Store respirators away from heat and moisture.
- Store respirators such that the sealing area does not become distorted or warped.
- Store respirator such that the face piece is protected.

5.11.1 Face Piece Seal Protection

The Company does not permit respirators with tight-fitting face pieces to be worn by employees who have:

- Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function, or
- Any condition that interferes with the face-to-face piece seal or valve function.

If an employee wears corrective glasses or goggles or other personal protective equipment, the company shall ensure that such equipment is worn in a manner that does not interfere with the seal of the face piece to the face of the user.

5.11.2 Continuing Effectiveness of Respirators

The company shall ensure that employees leave the respirator use area:

- To wash their faces and respirator face pieces as necessary to prevent eye or skin irritation associated with respirator use,
- If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, and
- To replace the respirator or the filter, cartridge, or canister elements.

If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece, the company will replace or repair the respirator before allowing the employee to return to the work area.

5.12 Procedures for IDLH Atmospheres

For all IDLH atmospheres, the company shall ensure that:

- One employee or, when needed, more than one employee is located outside the IDLH atmosphere.

- Visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.
- The employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue.
- The company or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue, and
- The company or designee authorized to do so by the company, once notified, provides necessary assistance appropriate to the situation.
- Employee(s) located outside the IDLH atmospheres will be equipped with:
  - ❖ Pressure demand or other positive pressure SCBA's, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA, and either,
  - ❖ Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry, or
  - ❖ Equivalent means for rescue where retrieval equipment is not required.

5.13 Cleaning and Disinfecting

The company shall provide each respirator user with a respirator that is clean, sanitary, and in good working order. The company shall ensure that respirators are cleaned and disinfected using the Standard Operating Procedure (SOP):

a. The respirators shall be cleaned and disinfected when:

- Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition,
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals,
- Respirators maintained for emergency use shall be cleaned and disinfected after each use,
- Respirators used in fit testing and training shall be cleaned and disinfected after each use, and
- Cleaning and Storage of respirators assigned to specific employees is the responsibility of that Employee.

5.13.1 Procedures for Cleaning Respirators

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43ºC [110ºF] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43ºC [110ºF] maximum), preferably running water than drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

   1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43ºC (110ºF); or,

   2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43ºC (110ºF); or,

   3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43ºC [110ºF] maximum), preferably running water.

F. Drain—The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

G. Components should be hand-dried with a clean lint-free cloth or air-dried.

H. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

I. Test the respirator to ensure that all components work properly.

5.14 Respirator Inspection

All respirators/SCBA's, both available for "General Use" and those on "Permanent Check-out", will be inspected after each use and at least monthly. Should any defects be noted, the respirator/SCBA will be taken to the program Administrator. Damaged Respirators will be either repaired or replaced. The inspection of respirators loaned on "Permanent Check-out" is the responsibility of that trained Employee.

a. Respirators shall be inspected as follows:

- All respirators used in routine situations shall be inspected before each use and during cleaning
- All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer's recommendations, and shall be checked for proper function before and after each use
- Emergency escape-only respirators shall be inspected before being carried into the workplace for use

b. Respirator inspections include the following:

- A check of respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters.
- Check of elastomeric parts for pliability and signs of deterioration.
- Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer's recommended pressure level. The company shall determine that the regulator and warning devices function properly.

c. Emergency use Respirators, the additional requirements apply:

- Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator.
- Provide this information on a tag or label that is attached to the storage compartment for the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

5.15 Respirator Storage

a. Respirators are to be stored as follows:

- All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.
- Emergency Respirators shall be:
  - ❖ Kept accessible to the work area,
  - ❖ Stored in compartments or in covers that are clearly marked as containing emergency respirators, and
  - ❖ Stored in accordance with any applicable manufacturer instructions.

5.16 Repair of Respirators

Respirators that fail an inspection or are otherwise found to be defective will be removed from service to be discarded, repaired or adjusted in accordance with the following procedures:

- Repairs or adjustments to respirators are to be made only by persons appropriately trained to perform such operations and shall use only the respirator manufacturer's NIOSH-approved parts designed for the respirator,
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed, and
- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

5.17 Breathing Air Quality and Use

The company shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen, and
- Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
  1. Oxygen content (v/v) of 19.5-23.5%,
  2. Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less,

3. Carbon monoxide (CO) content of 10 ppm or less,
4. Carbon dioxide content of 1,000 ppm or less, and
5. Lack of noticeable odor.

- Compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air,
- Oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution,
- Cylinders used to supply breathing air to respirators meet the following requirements,
- Cylinders are tested and maintained as prescribed in the shipping container specification regulations of the department of transportation (49 CFR part 173 and part 178),
- Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for grade d breathing air,
- Moisture content in breathing air cylinders does not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure,
- Breathing air couplings are incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines, and
- Breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

6.0 RECORDKEEPING

This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate employee involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

Medical Evaluation:

Records of medical evaluations required by this section must be retained and made available.

Fit Testing:

The employer shall establish a record of the qualitative and quantitative fit tests administered to an employee including:

- The name or identification of the employee tested,
- Type of fit test performed,
- Specific make, model, style, and size of respirator tested,
- Date of test, and
- The pass/fail results for QLFT's or the fit factor and strip chart recording or other recording of the test results for QNFTs.
- Fit test records shall be retained for respirator users until the next fit test is administered.
- A written copy of the current respirator program shall be retained by the employer.

- Written materials required to be retained shall be made available upon request to affected employees and to the Assistant Secretary or designee for examination and copying.

7.0 REFERENCES

1.	**Documents & External References** § 20.1703 Use of individual respiratory protection equipment, https://www.nrc.gov/reading-rm/doc-collections/cfr/part020/part020-1703.html, https://www.osha.gov/Publications/OSHA3789info.pdf, OSHA Standard 1910.134,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this training program is to ensure a safe and incident free lifting operation in the onshore and offshore environment. Robinson Brothers Construction, Inc. is dedicated to the protection of our employees from occupational injuries and illnesses. To reduce the potential for serious injury or death while rigging & lifting materials with the help of cranes. This program was developed to communicate the proper techniques of rigging. Robinson Brothers Construction, Inc. is responsible for providing a safe working environment, and the employees have and must assume the responsibility of working safely.

1.1 Scope

All Robinson Brothers Construction, Inc. employees that work onshore or in the Outer Continental Shelf (OCS) are to receive training in "rigging." When work is performed on a non--owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Crane	Machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine.
Hoist	A machinery unit that is used for lifting and lowering a freely suspended load.
Jib	Horizontal cantilever track on which the trolley and hoisting mechanisms travel.
Outer Continental Shelf	All submerged lands lying seaward and outside of the area of lands beneath navigable waters beginning three (3) miles from the coastline extending outwards and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control.
Overhead Bridge	A crane with a single or multiple girder movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.
Rigging	The term "rigging" refers to both of the following: • The hardware and equipment used to safely attach a load to a lifting device. • The process of safely attaching a load to a hook by means of adequately rated and properly applied slings and related hardware.

2.1 Policy Statement

Robinson Brothers Construction, Inc. is committed to providing a safe and healthy work environment for all employees. In pursuit of this goal, this policy provides the minimum requirements to ensure the Rigging &

Material Handling program is successfully and consistently implemented. Those regulations applicable to the Company are included in this written plan; however, it is recommended to review all applicable OSHA and ANSI regulations and standards when determining the appropriate rigging and material handling for any given job or task.

This purpose of the Rigging & Material Handling Program is to complement the Company's training program by setting proper guidelines that all employees must follow when rigging and handling material in order to prevent accidents from occurring in the worksite. The program will address several topics including the responsibilities of all employees, hazard assessments, employee training, and proper selection of tools when rigging and handling material. Each employee will receive the appropriate training in these procedures and strictly adhere to them except when doing so would expose the employee to a greater hazard.

2.2 Responsibilities

2.2.1 HSE Department

- Conducting workplace hazard assessments to determine the severity of hazards associated with rigging and material handling.
- Selecting and purchasing tools used in rigging operations.
- Review, update and conduct Job Hazard Risk Assessments (JHRA) when the following occurs:
  - ❖ New or change in job procedure.
  - ❖ New equipment is used.
  - ❖ Following an accident or spill.
  - ❖ When management determines, it is necessary.
  - ❖ Annually.
- Maintaining records on rigging and material handling training.
- Provide training and support to supervisors and employees on the proper techniques associated with rigging and material handling.
- Review, evaluate, and update the overall effectiveness of the Company's rigging and material handling policy and program.

2.2.2 Operations Management

- Provide necessary tools and equipment to conduct rigging material and handling operations safely.
- Ensure employees are trained on the proper use of rigging and material handling equipment.
- Ensure rigging, and material handling training certification and evaluation forms are signed and given to the HSE Director.
- Ensure employees properly use and maintain rigging equipment.
- Notify and work with the HSE Director when new jobs or hazards require a change in the rigging and material policy or procedures.

- Address violations of the Company's rigging and material handling policy and program with employees.
- Ensure damaged rigging and material handling equipment is immediately "taken out of service."
- and disposed.

2.2.3 Employees

- Properly utilize rigging and material equipment and procedures.
- Attending required rigging and material equipment training.
- Properly inspect and maintain rigging and material handling equipment.
- Follow all Company rigging and material handling policies.
- Informing supervisors of defective rigging and material handling equipment.

3.0 SAFETY

3.1 Crane Safety

- Cranes must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (when necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met.
- The crane manufacturer's procedures and prohibitions must be compiled with when assembling and disassembling equipment.
- The assembly/disassembly of equipment must be directed by a competent and qualified person.
- The work zone shall be identified by demarcating boundaries such as flags and range limiting devices, or defining the work zone as 360 degrees around the equipment up to the maximum working radius.
- The hazard assessment must determine if any part of the equipment could get closer than 20 feet to a power line.

4.0 TRAINING

A "Qualified Offshore Rigger" shall successfully complete an approved "Rigger" course. To successfully complete an approved "API2D Rigger" course, the company employee must verify that they have gained knowledge through:

- Participating in classroom lectures,
- Participating with hands-on training, and
- Successfully passing a written exam.

Once the employee successfully completes the course, a "Rigger" card will be issued to that individual. During the classroom lectures, hands-on training, and written exam the Robinson Brothers Construction, Inc. employee shall display their competency in the following topics:

- The selection of proper hardware (eyebolts, shackles, hooks, wire rope products, synthetic slings, chain slings, etc.) for the correct application (weight, hitches, angles, temperatures, the center of gravity, etc.).
- The proper methods of securing the load, attaching the load to the hook, lifting the load, handling of the load during the movement of the load, and lowering and placement of the load.
- The proper storage of the rigging equipment. All Robinson Brothers Construction, Inc. employees shall re-certify their "qualified rigger" training on a four (4) year basis.

5.0 PROCEDURE

5.1 General

Only "qualified riggers" are allowed to attach any loads to a lifting hook and only "qualified operators" are allowed to operate a crane while engaged in lifting operations onshore or on the Outer Continental Shelf. API RP-2D has established a three-tiered classification. Employees will be certified in the applicable classifications as required before starting job assignments requiring rigging and lift operations offshore:

- Qualified rigger.
- Qualified inspector.
- Qualified operator.

Work areas will be kept free of obstacles and the floors clean. Pallets will not obstruct light and ventilation in areas where they are needed. The program for monitoring the health of workers should consider at least the following:

- The implementation of medical examinations for admission to integrate the work related medical records;
- The practice of medical examinations in accordance with the specific activity of workers, subject to annual clinical follow-up or the evidence of signs or symptoms that denote alteration of the health of workers.
- The application of preventive and corrective actions for monitoring the health of workers shall be carried out on the basis of the detected risk factors and the results of medical examinations.

5.2 Material Handling

- Rigging equipment shall be inspected to ensure it is safe.
- Rigging equipment for material handling shall be inspected prior to use and on each shift and as necessary during its use to ensure that equipment is safe.
- Defective rigging equipment shall not be used and removed from service.
- Rigging equipment shall not be loaded beyond its recommended rated capacity, and load identification shall be attached to the rigging.
- Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees.
- Tag lines shall be used unless their use creates an unsafe condition.

- Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.
- All employees shall be kept clear of loads about to be lifted and of suspended loads. No employee shall be allowed under a suspended load.

5.3 Inspection and Replacing Equipment

The HSE shall work with supervisors to ensure that all rigging and material handling equipment is regularly inspected and that all potential hazards are identified. Supervisors shall work with employees to identify hazards and unsafe equipment, and any unsafe equipment shall immediately be removed from service. Inspections should be conducted prior to use on each shift and as necessary to ensure all equipment is in a safe working condition. The following are examples of conditions that may lead to unsafe working conditions and should be identified during inspections:

5.3.1 Synthetic Slings

- Torn stitching
- Broken fibers
- Heat or stress damage (fraying)
- Abnormal wear
- Discoloration

5.3.2 Wire/Rope Slings

- Kinking and/or crushing
- Heat or stress damage
- Broken wires
- Deformation of hooks such as twisting or the hooks opened more than 15% at the throat

5.3.3 Hooks

- Overhaul ball assemblies
- Lower load blocks
- Attachments that can close and lock that eliminating the hook throat opening

5.4 Rigging A Load

When rigging a load, the follow procedures must be followed:

- Determine the weight of the load by using accurate instruments.
- Select the proper size for slings and components.
- Ensure shackle pins, and shouldered eye bolts are installed according to manufacturers recommendations
- Ensure eyebolts are threaded at least 1.5 times the bolt diameter

- Use safety hoist rings as a preferred substitute for eye bolts
- Only use hooks that have safety latches to ensure the hook throat opening is eliminated.
- Pad sharp edges to protect slings to prevent increased likelihood of cutting into riggings while under heavy loads.
- Determine the center of gravity and balance load accordingly prior to moving.
- Always test the rigging by lifting the load only a few inches and holding in position.
- Tag lines shall be used when lifting and moving a load unless their use creates an unsafe working condition.

6.0 RECORDKEEPING

All training sessions and inspections should be appropriately documented and maintained by the individual departments. Training sessions should have a sign-in sheet. Proof of required training should be maintained in the employee's personnel file.

7.0 REFERENCES

1.	**Documents & External References** Material Handling Factsheet_2, Material Handling Rigging_1, Rigging-Material-Handling-Policy, 0049 Rigging.

8.0 REVISION INFORMATION

This is applicable to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

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AUTHORIZATION

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1.0 PURPOSE

The purpose of a risk assessment is to systematically identify all of the risks associated with a task, activity or process and put appropriate controls in place to eliminate or reduce the risks associated with the task, activity or process.

1.1 Scope

This procedure is intended to assist in ensuring a safe and healthy work environment. Completing a risk assessment also ensures that hazards, risks and the method for controlling risks are documented and can be used to communicate this information to relevant Management.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Identifying Hazards	Finding out what situations and things could cause death, injury or illness.
Assessing Risks	Understanding the nature of the risk that could be caused by the hazard, what the consequences could be and the likelihood of it happening.
Controlling Risks	Implementing the most effective control measures that are reasonably practicable in the circumstances » reviewing control measures: ensuring control measures are working as planned.
Reviewing Control	Ensuring control measures are working as planned.

2.1 Roles and Responsibilities

Everyone has a part to play in managing risk effectively.

2.1.1 Company Safety Officers (CSO)

- Ensure workers, and others know about health and safety risk processes and procedures,
- Ensure that workers receive the right health and safety risk training and are aware of the risks on induction into the work area,
- Hold and maintain the risk register for the work group,
- Inform ‘others in the workplace’ of any known risks and controls in place,
- Assess risks that are reported to you,
- Consult with workers on the most effective controls to manage the risks, and
- Regularly review and monitor risks and the controls that are in place.

2.1.2 Health, Safety, and Environmental (HS&E) Department

- Facilitates cooperation between the company Management and employees in instigating, developing, and carrying out measures designed to ensure Robinson Brothers Construction, Inc. employees' health and safety at work,
- Assists in developing any standards, rules, policies, or procedures relating to health and safety that are to be followed or complied with at the company, and
- Makes recommendations to Management about the work health and safety.

2.1.3 Employees (Temporary Workers, Contractors, Volunteers)

- Take reasonable care of their own health and safety,
- Take reasonable care that their actions are not a risk to the health and safety of others,
- Take reasonable steps to eliminate risks when they are first identified,
- Report any risks to their relevant Management, including those that have already been eliminated,
- Seek support from the health and safety representative on health and safety risk matters if required,
- Comply with this policy and procedures in the workplace,
- Comply with any reasonable instruction in relation to risks given by the Management or the company they are visiting,
- Inform others of known risks, and
- May cease or refuse to carry out work if they believe the work would expose them to a serious risk.
- Comply with any reasonable instruction given by the company in relation to risks.

3.0 SAFETY

3.1 Common Hazard Identification

Here are some examples of common hazards arising from work activities and their potential harm:

- Falling objects, and falls, slips, and trips of people – bruises, lacerations,
- Dislocations, fractures, concussion, permanent injuries or death,
- Vehicles, plant, machinery, equipment,
- Dislocations, fractures, concussion, permanent injuries or death,
- Repetitive movement – e.g. Data entry, Muscular strain, occupational overuse syndrome (OOS),
- Biological (bacteria, viruses) – e.g. Leptospirosis,
- Loud noise (from power tools in technology classes or noise levels) – permanent hearing damage,
- Bullying in the workplace – stress-related illness, and

- Hazardous substances – burns, skin conditions, respiratory problems.

Risk Assessment and Identification of Hazards is intended to lessen the common effects.

4.0 TRAINING

4.1 Provide Program Awareness Training

Provide training to all managers, supervisors, workers, and contractor, subcontractor, and temporary agency workers on:

- Provide information on the safety and health hazards of the workplace and the controls for those hazards.
- Ensure that training is provided in the language(s) and at a literacy level that all workers can understand.
- Emphasize that the program can only work when everyone is involved and feels comfortable discussing concerns, making suggestions, and reporting injuries, incidents, and hazards.
- Confirm, as part of the training, that all workers have the right to report injuries, incidents, hazards, and concerns and to fully participate in the program without fear of retaliation.

4.1.1 Train Workers on Their Specific Roles in the Safety and Health Program

Additional training may be needed to ensure that workers can incorporate any assigned safety and health responsibilities into their daily routines and activities. The following training includes:

- Instruct workers on how to report injuries, illnesses, incidents, and concerns. If a computerized reporting system is used, ensure that all employees have the basic computer skills and computer access sufficient to submit an effective report.
- Instruct workers assigned specific roles within the safety and health program on how they should carry out those responsibilities, including:
  - ❖ Hazard recognition and controls,
  - ❖ Participation in incident investigations, and
  - ❖ Program evaluation and improvement.
- Provide opportunities for workers to ask questions and provide feedback during and after the training.
- As the program evolves, institute a more formal process for determining the training needs of workers responsible for developing, implementing, and maintaining the program.

4.1.2 Train Workers on Hazard Identification and Controls

Providing workers with an understanding of hazard recognition and control and actively involving them in the process can help to eliminate hazards before an incident occurs. The following training includes:

- Train workers on techniques for identifying hazards, such as job hazard analysis
- Train workers so they understand and can recognize the hazards they may encounter in their own jobs, as well as more general work-related hazards.

- Instruct workers on concepts and techniques for controlling hazards, including the hierarchy of controls and its importance.
- Train workers on the proper use of work practice and administrative controls.
- Train workers on when and how to wear required personal protective equipment.
- Provide additional training, as necessary, when a change in facilities, equipment, processes, materials, or work organization could increase hazards, and whenever a worker is assigned a new task.

5.0 PROCEDURE

The companies Risk Assessment (Identification of Hazards) program must provide processes to ensure employees and/or sub-contractors are actively involved in the hazard identification process and hazards are reviewed with all employees concerned. Provide mechanisms to involve workers and their elected representatives in the development of the worker safety and health program goals, objectives, and performance measures and in the identification and control of hazards in the workplace

5.1 Identifying Risk Management

In accordance with the Work Health and Safety Act (the Act) and Regulations, Robinson Brothers Construction, Inc. has an obligation to 'manage risks' that occur at Robinson Brothers Construction, Inc. or as a result of Robinson Brothers Construction, Inc.'s business/activities, so far as is reasonably practicable. This entails:

- Identifying foreseeable hazards and the risks associated with these hazards assessing the risks - determining the consequence and likelihood of the risk occurring,
- Controlling the risk – implementing control measures to eliminate or reduce the risks, and
- Monitor and review of the above process,

This is referred to as the 'Risk Management Process.' In accordance with Robinson Brothers Construction, Inc.'s policy, this process must then be documented in the form of a risk assessment.

For every task, activity or process at Robinson Brothers Construction, Inc. that has a risk or potential risk to health and/or safety a risk assessment must be undertaken. For example, a risk assessment should be undertaken when:

- Undertaking any high-risk work planning an event,
- Starting a new project,
- Changing work practices, procedures or environment (such that new hazards are identified),
- Responding to health and safety concerns raised by workers, health and Safety representatives or others at the workplace, and
- New hazards have been identified.

5.2 Performing Risk Assessment

Basic requirements for include:

- A risk assessment must include a brief statement outlining the task, activity or process that is being

covered by the risk assessment and the date it is to take place.

- The supervisor or manager of the task, activity or process **MUST** be involved in the risk assessment process.
- Risk assessments must be approved or authorized, usually by a department head or cost center manager or their representative. This person must have sufficient knowledge of the activity to understand the hazards and risks involved.
- Risks assessments must be reviewed every twelve months or as required (i.e., when new hazards are identified, after incidents or near misses, if there are any changes that may introduce additional hazards).
- The author of the risk assessment must be identified.
- There must be evidence that all employees directly involved in the activity detailed in the risk assessment have read and understood this procedure.

5.3 Steps in Doing a Risk Assessment

5.3.1 Define the Scope

This means setting the boundaries of what you are going to be working on.

Once the scope has been defined, break the activity into components, this can make it easier to identify all hazards involved:

- Loading vehicle,
- Travel,
- Unload and set up, and
- "Activity" set up.

5.3.2 Identify the Risks

Looking at one component at a time, brainstorm all of the hazards or potential risks and list them in the left-hand column of the risk assessment table. For example:

Example of Risk Assessment Form

Risk Assessment Form				**Date:**	
Potential Hazard	**Who is at Risk**	**Existing Control Measures**	**Risk Rating**	**Preventative Measures**	**Responsibilities**
Initiator's Name:			**Place:**		

a. Loading Vehicle

- Musculoskeletal injury, and

- Slips trips and falls.

b. Travel

- Traffic accident
- Loss of unsecured equipment
- Mechanical problems/breakdowns (including running out of fuel)
- Getting lost

This must be done for every component identified. There may be some repetition at this stage, as risks such as Musculoskeletal injury will occur throughout many components of a task, activity or process. How you act on this risk in each different component may vary considerably though, so it should still be recorded.

5.3.3 Assess the Risks

When all the risks have been identified, move on to ascertaining the levels of risk associated with each one. To do this you have to determine the potential consequence of the risk if it were to occur, and the potential likelihood of this happening. The consequence is described using the table below:

Table 1.: Consequence

Consequence	
Rating	**Criteria**
Insignificant	• Minor injury • No or basic first aid required
Minor	• Medical or paramedical treatment • Up to four days lost time from work • Small amount of local print media coverage (< one week)
Moderate	• Treatment by hospital EMD or admission to hospital and/or four or more days lost time from work. • Persistent negative local and/or state media coverage. • Short term disruption to core activities (days). • Long-term disruption to noncore activities (weeks). • Small scale investigation by regulatory bodies (local branch only). • Any notifiable incident that does not lead to injury i.e. does not require medical or paramedical treatment (e.g., electrical incident with no injury). • Uncontrolled nonhazardous chemical spill/release.
Major	• Permanent impairment/disability (unable to return to work). • National and/or international negative media coverage. • Medium term disruption to core activities (weeks). • An investigation by regulatory bodies with the prosecution, enforceable undertakings and/or possible criminal charges or civil suits. • Any notifiable incident requiring medical attention. • Uncontrolled hazardous chemical spill/release.
Catastrophic	Fatality/ies

	• Significant damage to reputation. • Widespread, ongoing negative media coverage. • Long-term cessation of core activities. • The investigation is resulting in large legislative breaches and resultant. • legal actions, criminal charges, civil suits. • Long-term extensive environmental damage.

Using **Table 1:** look at the potential consequence. To ensure that health and safety risk is approached at in a uniform manner, you must use the criteria listed in the table. You are aware that there are heavy items to be loaded, as well as numerous items that need to be stored on the roof racks. You decide that this could cause an injury that could potentially lead to hospitalization. Hence the consequence is “Moderate.”

(Table 2): Likelihood	
Rating	**Criteria**
Rare	May only occur in exceptional circumstances
Unlikely	The risk event could occur at some time (during a specified period), but it is unlikely
Possible	Might happen at some time, occurrence would not be unusual
Likely	Will probably occur in most circumstances
Almost Certain Is expected to occur in most circumstances	

Using **Table 2:** look at likelihood. This is the predicted likelihood of the risk event occurring. This must be determined by using the criteria listed in the table. For example, you may be looking at the risk of Musculoskeletal injury whilst loading the car. You determine that it is “Possible” that an injury may occur (remember that this is without any controls in place).

Once you have determined both the consequence and the likelihood you combine them using the **Risk Matrix (Table 3)** to determine the risk rating. For example: if you have determined that the consequence of a Musculoskeletal injury is “Moderate” and the likelihood of this injury occurring is “Possible,” the resulting risk rating is "Medium." Use the risk matrix to determine the risk rating in Table 3. Risk Matrix.

(Table 3): RISK MATRIX						
	CONSEQUENCE					
Likelihood		**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	High

It is important to note that an event does not have to result in a major injury or illness to be considered a high priority. A small incident happening frequently and affecting many people can often be considered a high priority.

It is paramount that the likelihood and consequence tables are used and combined using the risk matrix provided to determine the level of risk. This lessens the chance of people using their own biases when interpreting risk. This also standardizes the way we look at and interpret risk.

5.3.4 Decide on Control Measures

Now that the risk rating has been determined we can then ascertain what sort of action we need and its priority. Obviously, something with a higher risk rating is of greater priority.

When deciding how to reduce risk, it is important that you do so in accordance with the "Hierarchy of Control," depicted below. This stipulates the best methods for controlling risks.

5.3.5 Hierarchy of Controls

I. Elimination. Eliminating the hazard is the best and most effective way of controlling it. This may mean not doing the activity or part of the activity.

If this is not practical then:

II. Substitution. This refers to substituting something that you have deemed to be a risk with something that is a lower risk that achieves the same or similar thing. an example of this would be substituting a hazardous chemical with a less hazardous chemical.

If this is not practical then:

III. Engineer. This requires a redesign of the workplace to make it safer. Examples might be: non-slip flooring/paving to prevent slips, trips and falls, the provision of storage facilities to ensure safe and effective storage of items, the introduction of mechanical lifting aids/devices, the purchase of low noise tools and machinery.

If this is not practical then:

IV. Administration. Administrative controls include policies, procedures, guidelines, and training. These provide people with information and skills about safe work practices. However, they are not as effective as controls i – iv. The above controls, especially the first two, are designed to remove the hazard and eliminate the risk. With administrative controls, the hazard still exists, we are relying on guiding human behavior to reduce the level of risk. Teaching people to drive safely does not prevent road hazards and hence road accidents.

If this is not practical then:

V. Personal protective equipment (PPE). The least effective control measure is PPE, such as gloves, plastic gowns or aprons, safety glasses, boots, etc. This relies on the PPE being available, in good working order, being used appropriately or being used at all. Again, this does not eliminate the hazards or risks, so should not be used as the only control but in conjunction with other controls.

The best way to control any hazard/risk is to eliminate it, but this is not always feasible. The most effective way to control or lessen the risks associated with the hazards identified is to use a combination of controls. For example:

- Have policies, procedures, and guidelines, that assign responsibility and
- Provide information about safe work practices
- Provide training and supervision to ensure policies and procedures are being followed and to ensure competency

- Consider health, safety, and wellbeing in the design and purchasing of any equipment.

You should record the controls you plan to implement on your risk assessment form and the residual risk. The residual risk is calculated in the same way as the initial risk, by determining the likelihood and consequence in accordance with the tables used earlier and then combining them in the risk matrix.

At this stage, the risk assessment should be authorized or approved. This process involves another party (usually a department head or cost center manager or their representative) reviewing the risk assessment to ensure that it is appropriate and that the implementation of controls is approved. For more complex risk assessments or if numerous stakeholders are involved, it may be advisable to have two people authorizing the risk assessment. The person approving the risk assessment must have sufficient knowledge of the task/activity being undertaken and the hazards and risks involved. They must be satisfied that all hazards have been identified and that the controls listed in the risk assessment:

- Are realistic and achievable,
- Will reduce the level of risk,
- Will not cause additional hazards (e.g., requiring people to wear ear plugs, and
- Ear plugs prevent people from hearing emergency instructions/warnings, and these are not removed properly, they could cause damage to the eardrum).

The following points should be considered when reviewing a risk assessment for approval:

  - ❖ Are there any Robinson Brothers Construction, Inc. policies, procedures or guidelines that pertain to this work (e.g., working from home)?
  - ❖ Has this been taken into account in the risk assessment?
- Are there likely to be legislative compliance issues associated with this task/activity (e.g., work involving:
  - ❖ Is the person/s involved in the activity/task suitably qualified?
  - ❖ Are specific licenses or authorizations required for any part of the work (e.g., high-risk work, working with prohibited and restricted carcinogens and/or restricted hazardous chemicals?)
  - ❖ Are any hazardous chemicals used? Are these detailed in the risk assessment?
- Does the task/activity involve:
  - ❖ Working remotely,
  - ❖ Working alone, and
  - ❖ Working after hours.

If so, is there a communication plan and an emergency plan detailed in the risk assessment?

If you are required to approve a risk assessment, you must be ensured, as far as is reasonably practicable, that the risk assessment identifies the hazards and controls the risks. If there are hazards that have not been identified, or you believe that insufficient controls are being implemented to control the risk, you should not approve the risk assessment. You should discuss this with the author and request that suitable changes are made.

Do not approve a risk assessment that you do not feel achieves its objective, which is to identify hazards and control risks associated with the hazards.

Note: if the risk rating cannot be reduced to 'Low' the risk assessment must also have the approval of the Head of the Department or Cost Centre Manager (this cannot be delegated to a representative). To continue with a task, process or activity that has a risk rating of 'Moderate' or above the risk assessment must have the approval of, and be signed by, the Head of the Department or Cost Centre Manager.

5.3.6 Implement Controls

Once you have decided on the controls you are going to put in place, and the risk assessment is authorized or approved, you have to implement these controls. This may require the addition of further training, procedures, or guidelines.

5.3.7 Monitor and Review

The next step is the most important step, as there is no use implementing controls if you don't monitor and review what you have implemented. This should be a continual process if it is to be effective. The best-planned control measures may not be as effective as you thought they would be once put into practice. Or, you may find that some controls may cause unintended additional hazards. If this is the case, you may have to implement further controls. Any changes should be documented on your risk assessment. Copies of risk assessments should be retained, even the ones that have been reviewed and/or changed.

6.0 RECORDKEEPING

The following information is maintained as a result of this process:

- The identified hazards, assessed risks, and chosen control measures (including any hazard checklists, worksheets and assessment tools used in working through the risk management process),
- How and when the control measures were implemented, monitored and reviewed,
- Whom you consulted with,
- Relevant training records, and
- Any plans for changes.

Storage time requirements range between 1, 3, and 5 years. Check the specific regulations that apply to your industry, but as "Best Practice," store safety and training records for 5 years.

Note: That some regulations have separate recordkeeping requirements and timelines. For example, asbestos training records are required to be kept one year past the last date of employment of a worker. Employee medical records need to be kept for the length of employment plus 30 years

7.0 REFERENCES

1.	**Documents & External References** Risk management and risk assessment for health and safety _ University of the Sunshine Coast, http://www.usc.edu.au/connect/work-at-usc/health-safety-and-wellbeing/safety/risk-assessments-and-management, https://www.osha.gov/shpguidelines/education-training.html,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY: Name & Title

1.0 PURPOSE

The purpose of this safety policy and procedure is to establish guidelines for the protection of Robinson Brothers Construction, Inc. employees who work on scaffold work surfaces.

1.1 SCOPE

This program is applicable at every work area where scaffolding is erected. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Brace	A tie that holds one scaffold member in a fixed position with respect to another member.
Coupler	A tie that holds one scaffold member in a fixed position with respect to another member.
Harness	A design of straps which is secured about the employee in a manner to distribute the arresting forces over at least the thighs, shoulders, and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration device.
Hoist	A mechanical device to raise or lower a suspended scaffold. It can be mechanically powered or manually operated.
Maximum Intended Load	A total load of all employee, equipment, tool, materials, transmitted, the wind, and other loads reasonably anticipated to be applied to a scaffold or scaffold component at any one time.
Mechanically Powered Hoist	A hoist which is powered by other than human energy.
Outriggers	The structural member of a supported scaffold used to increase the base width of a scaffold in order to provide greater stability for the scaffold.
Platform	Manually propelled mobile scaffold.
Maximum intended load	The horizontal working surface of a scaffold.

Mid-Rail	A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.
Scaffold	Any temporary elevated or suspended platform and its supporting structure used for supporting employees or materials or both, except this term does not include crane or derrick suspended personnel platforms
Toe-Board	A barrier secured along the sides and ends of a platform, to guard against the falling of material.

2.1 Responsibilities

2.1.1 Managers

- Managers will ensure adequate funds are available and budgeted for the purchase of scaffolds in their areas.
- They will also identify the employees affected by this safety policy and procedure.
- Managers will obtain and coordinate the required training for the affected employees.
- Managers will also ensure compliance with this safety policy and procedure through their auditing process.

2.1.2 Supervisors

- Supervisors will not allow any employee who has not received the required training to perform any of the tasks or activities related to scaffold erection and/or dismantling.
- Supervisors will communicate appropriate needs to managers and/or supervisors.
- Supervisors will ensure that employees are provided with PPE as necessary for their job.
- Supervisors will ensure that a competent person is in charge of scaffold erection according to the manufacturer's specifications.

2.1.3 Competent Person

The competent person will oversee the scaffold selection, erection, use, movement, alteration, dismantling, maintenance, and inspection. The competent person will be knowledgeable about proper selection, care, and use of the fall protection equipment. Additionally, the competent person shall assess hazards.

2.1.4 Employees

- Employees shall comply with all applicable guidelines contained in this safety policy and procedure.
- Employees will report damaged scaffolds, accessories, and missing or lost components. Employees will assist with inspections as requested.

2.1.5 Safety Department

- Safety Department will provide prompt assistance to managers, supervisors, or others as necessary on any matter concerning this safety policy and procedure.
- Safety Department will assist in developing or securing required training.
- Safety Department will also work with Purchasing to ensure that all newly purchased scaffolds comply with current safety regulations and this safety policy and procedure.
- Safety Engineers will provide consultative and audit assistance to ensure effective implementation of this safety policy and procedure.

2.1.6 Purchasing Department

Purchasing Department is responsible for ensuring that purchased scaffolds and related material and equipment meet or exceed current safety regulations.

3.0 SAFETY

3.1 Fall Protection Requirements

- Fall protection includes guardrail systems and personal fall arrest systems.
- Personal fall arrest systems include harnesses, components of the harness/belt such as Dee-rings, and snap hooks, lifelines, and anchorage point.

3.1.1 Vertical or Horizontal Lifelines

- Lifelines must be independent of support lines and suspension ropes and not attached to the same anchorage point as the support or suspension ropes.
- When working from an aerial lift, attach the fall arrest system to the boom or basket.

3.1.2 Fall Protection Requirements for All Scaffolds

- Employers must provide fall protection for each employee on a scaffold more than 10 feet (3.1 meters) above a lower level.
- A competent person must determine the feasibility and safety of providing fall protection for employees erecting or dismantling supported scaffolds.

The chart below illustrates the type of fall protection required for specific scaffolds.

Type of Scaffold	Fall Protection Required
Aerial Lifts	Personal fall arrest system
Boatswains' Chair	Personal fall arrest system
Catenary Scaffold	Personal fall arrest system
Crawling Board (Chicken Ladder)	Personal fall arrest system, or a guardrail system, or by a 3/4-inch (1.9 cm) diameter grab line or equivalent handheld securely fastened beside each crawling board

Float Scaffold	Personal fall arrest system
Ladder Jack Scaffold	Personal fall arrest system
Needle Beam Scaffold	Personal fall arrest system
Self-Contained Adjustable Scaffold When Supported by Ropes	Both a personal fall arrest system and a guardrail system
Single-Point Two-Point Suspension Scaffolds	Both a personal fall arrest system and a guardrail system
Supported Scaffold	Personal fall arrest system or guardrail system
All Other Scaffolds Not Specified Above	Personal fall arrest system or guardrail systems that meet the required criteria

4.0 TRAINING

The employer shall have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training shall include the following areas, as applicable:

- The nature of scaffold hazards, and the safe use of scaffolds.
- The nature of any electrical hazards, fall hazards and falling object hazards in the work area,
- The correct procedures for dealing with electrical hazards and for erecting, maintaining, and disassembling the fall protection systems and falling object protection systems being used,
- The proper use of the scaffold, and the proper handling of materials on the scaffold,
- The design criteria, maximum intended load-carrying capacity and intended use of the scaffold, and
- The employer shall have each employee who is involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting a scaffold trained by a competent person to recognize any hazards associated with the work in question.
- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question, and

4.1.1 Training Standards for Employees

All employees who work on a scaffold must be trained by a person qualified to recognize the hazards associated with the type of scaffold used and to understand the procedures to control and minimize those hazards. 1926.454(a)

4.1.2 Training Standards for Employees Who Work on Scaffold

Employees working with Scaffolds who work on, erect, dismantle, move, operate, repair, maintain, or inspect scaffolds:

- A *competent person* must train all employees who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds.
- Training must cover the nature of the hazards, the correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintain the type of scaffold in use.
- Other recommended training topics include erection and dismantling, planning, personal protective equipment, access, guys and braces, and parts inspection.

4.1.3 Retraining Requirements for Employees Working on Scaffolds

The standard requires retraining when:

1. No employee training has taken place for the worksite changes, scaffold changes, or falling object protection changes, or
2. Where the employer believes, the employee lacks the necessary skill, understanding, or proficiency to work safely.

5.0 PROCEDURE

Safe scaffold erection and use are important in minimizing and controlling the hazards associated with their use. Scaffold work practices and rules should be based on:

- Sound design
- Selecting the right scaffold for the job
- Assigning personnel
- Fall protection
- Guidelines for proper erection
- Guidelines for use
- Guidelines for alteration and dismantling
- Inspections
- Maintenance and storage

5.1 Types of Scaffolds

There are many different types of scaffolds used in Robinson Brothers Construction, Inc. The three major categories are:

- Self-supporting scaffolds
- Suspension scaffolds
- Special use scaffolds

5.1.1 Self-Supporting Scaffolds

Self-supporting scaffolds are one or more working platforms supported from below by outriggers, brackets, poles, legs, uprights, posts, frames, or similar supports. The types of self-supporting scaffolds include:

- Fabricated Frame
- Tube and Coupler
- Mobile
- Pole

5.1.2 Suspension Scaffolds

Suspension scaffolds are one or more working platforms suspended by ropes or other means from an overhead structures(s). The types of suspension scaffolds include:

- Single-Point Adjustable (Boatswain's Chairs)
- Two-Point Adjustable (Swing Stage)
- Multiple-Point Adjustable
- Multi-Lend
- Category
- Float (Ship)
- Interior Hung
- Needle Beam

5.1.3 Special Use Scaffolds

Special use scaffolds and assemblies are capable of supporting their weight, and at least 4 times the maximum intended load. The types of special use scaffolds include:

- Form and Carpenter Bracket
- Roof Bracket
- Outrigger
- Pump Jack
- Ladder Jack
- Window Jack
- Horse
- Crawling Boards
- Step, Platforms, and Trestle Ladder

5.2 Safety Requirements for Scaffolds

- The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.
- No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons or as requested for corrective reasons by Safety and Loss Control Personnel.

- Guardrails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height having a minimum horizontal dimension in either direction of less than 45 inches shall have standard guardrails installed on all open sides and ends of the platform.
- Guardrails must be 2 X 4 inches, or the equivalent, not less than 36 inches or more than approximately 42 inches high, with a mid-rail, when required, of 1 X 4-inch lumber, or the equivalent. Supports must be at intervals not to exceed 8 feet. Toe-board and the guardrail shall extend along the entire opening.
- Scaffolds and their components must be capable of supporting without failure at least 4 times the maximum intended load.
- Any scaffold, including accessories such as braces, brackets, trusses, screw legs, ladders, couplers, etc., damaged or weakened from any cause must be repaired or replaced immediately, and shall not be used until repairs have been completed.
- Any load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (Stress Grade) construction grade lumber.

All planking must be Scaffold Grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible span for 2 X 9 inch or wider planks is shown in the following:

- The maximum permissible span for 1-1/4 X 9 inch or wider plank of full thickness shall be 4 feet with medium duty loading of 50 p.s.f.
- All planking or platforms must be overlapped (minimum 12 inches) or secured from movement.
- An access ladder or equivalent safe access must be provided.
- Scaffold plank must extend over their end supports not less than 6 inches nor more than 18 inches.
- The poles, legs, or uprights of scaffolds must be plumb and securely and rigidly braced to prevent swaying and displacement.
- Overhead protection must be provided for men on a scaffold exposed to overhead hazards.
- Slippery conditions on scaffolds shall be eliminated immediately after they occur.
- No welding, burning, riveting, or open flame work shall be performed on any staging suspended by means or fiber of synthetic rope.
- Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals.
- Wire, synthetic, or fiber rope used for scaffold suspension shall be capable of supporting at least 6 times the intended load.
- Scaffolds shall be provided with a screen between the toeboard and guardrail, extending.
- Along the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half inch mesh or the equivalent, when personnel is required to work or pass underneath the scaffolds.
- A safe distance from energized power lines shall be maintained.
- Tag lines shall be used to hoist materials to prevent contact.

- Suspension ropes shall be protected from contact with heat sources (welding, cutting, etc.) and acids or other corrosive substances.
- Scaffolds shall not be used during high wind and storms.
- Ladders and other devices shall not be used to increase working heights on scaffold platforms.
- Scaffolds shall not be moved while employees are on them.
- Loose materials, debris, and/or tools shall not be accumulated to cause a hazard.
- Employees working on suspended scaffolds shall employ a fall-arrest system.
- Scaffold components shall not be mixed or forced to fit which may reduce design strength.
- Scaffolds and components shall be inspected at the erection location.
- Scaffolds shall be inspected before each work shift, after changing weather conditions, or after prolonged work interruptions.
- Casters and Wheel stems shall be pinned or otherwise secured to scaffold legs. Casters and wheels must be positively locked if in a stationary position.
- Tube and coupler scaffolds shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.

5.3 Inspections

Scaffolding shall be inspected, by a qualified person, in conjunction with the manufacturers required recommendations. The *Competent Person* must ensure scaffolds are safe prior to and during scaffold use.

At a minimum, the following shall be inspected after erection, before the start of the day or beginning of a shift change:

- Ground or surface footing shall be inspected to ensure that there is no settling.
- All main supports and cross braces shall be inspected for any signs of damage, missing pins, bolts and any locks and/or safety keepers.
    - ❖ All walking surfaces and/or planks shall be inspected for damage and proper placements and any possible movement.
    - ❖ All walkways and planks must be secured to prevent any movement.
- The inspection shall be made to ensure that the scaffold is stable and any movement is prevented.
- If during the inspection, a defect or damage to the scaffold is discovered, the scaffold shall be tagged out and use prohibited until needed repairs are made.

5.4 Mandatory Signs and Tags

Signs and Tags shall be visible at all times when work is being performed and shall be removed or covered promptly when the hazards no longer exist.

Defective or unsafe equipment or conditions shall be tagged out by the *Competent Person* using a weather-resistant tag secured to the scaffolding structure on all four sides.

- Danger signs shall be used only where an immediate hazard exists.

- Danger signs must be posted around the immediate area of the scaffold, to alert other workers of possible danger from falling objects from the scaffold.
- Caution Signs and/or barricade tape shall be used to mark off a larger area around scaffolding warning other workers to use caution.

5.5 Modifications

Modification and repairs shall be performed by a *Qualified Person*, who is competent to certify the scaffolding safe to use.

Employees shall not perform any modifications or repairs, unless they have been trained and certified, failure to comply may result in disciplinary action and or termination.

6.0 RECORDKEEPING

- HSE must keep records concerning scaffolding inspections, inventories and training.
- The Scaffolding Program Administrator will be designated by the company Engineering Department.
- All records must be kept for a minimum of 3 years within the department.
- The records must be made available to regulatory agencies upon request.

7.0 REFERENCES

1.	**Documents & External References** This safety policy and procedure are established in accordance with Occupational Safety and Health Standards for General Industry (29 CFR 1910.28) and Occupational Safety and Health Standards for Construction Industry (29 CFR 1926.451).

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this plan is to document spill prevention and response requirements Robinson Brothers Construction, Inc. jobsite will develop a spill prevention and response plan based on the requirements and template provided.

1.1 Scope

This procedure applies to all Robinson Brothers Construction, Inc. operations. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2.0 DEFINITIONS

There are no definitions specific to this document.

2.1 Responsibilities

2.1.1 Spill Coordinator

A Spill Coordinator shall be designated by the Contractor, subject to approval by Robinson Brothers Construction, Inc.. For pipeline spills, the Spill Coordinator shall ensure that the Robinson Brothers Construction, Inc. Representative is notified immediately, and may assist in response action as dictated by the Company. For all construction related spills, the following shall apply:

- The Spill Coordinator shall report all spills to the Robinson Brothers Construction, Inc. Representative immediately.
- The Spill Coordinator (under Robinson Brothers Construction, Inc. oversight), shall report spills to appropriate federal, state and local agencies as soon as possible.
- The Spill Coordinator shall mobilize on-site personnel, equipment, and materials for containment and/or clean-up commensurate with the extent of the spill.
- The Spill Coordinator shall assist the Emergency Response Contractor and monitor containment procedures to ensure that the actions are consistent with the requirements of this Spill Plan.
- The Spill Coordinator and/or Robinson Brothers Construction, Inc. Representative, in consultation with appropriate agencies, shall determine when it is necessary to evacuate spill sites to safeguard human health.
- The Spill Coordinator (under Robinson Brothers Construction, Inc. oversight), shall coordinate with appropriate agencies the need to contact additional parties or agencies, and
- The Spill Coordinator is responsible for completing a Spill Report Form within 24-hours of the occurrence of a spill, regardless of the size of the spill.

2.1.2 Environmental Inspector

The Environmental Inspector will monitor the Contractor's compliance with the provisions of this Spill Plan.

2.1.3 Authorized Personnel

- Authorized Personnel is representatives of the Contractor who are designated to handle fuel, lubricants or other regulated substances.
- Authorized Personnel must be familiar with the requirements of the Spill Plan and the consequences of non-compliance.

2.1.4 Construction Superintendent

The Contractor's Construction Superintendent or representative must notify the Robinson Brothers Construction, Inc. Representative and the Environmental Inspector immediately of any spill of a petroleum product or hazardous liquid, regardless of volume.

2.1.5 Construction Personnel

- Construction Personnel is representatives of the Contractor involved with the installation of the pipeline.
- Construction Personnel shall notify the crew foreman or Spill Coordinator immediately of any spill of a petroleum product or hazardous liquid, regardless of volume.

2.1.6 Robinson Brothers Construction, Inc. Representative

The Robinson Brothers Construction, Inc. Representative shall oversee the Spill Coordinator to ensure that appropriate agency notifications are made, spill resources are allocated, and clean-up is accomplished in accordance with applicable agency requirements.

3.0 SAFETY

3.1 Stop the Point Source of a Spill

Determine exact source of leak or spill, amount, and area affected by the release:

- After putting on personal protective equipment and after assessing the nature of the hazards and hazardous chemicals, remedy and stop the point source spill, if safe to do so.
- Stop spill material with standard industrial absorbent.
- Take the necessary action to keep the spill from spreading. Spread absorbent to surround and absorb the spilled material.
- Collect contaminated material (absorbent, rags, disposal suits, etc.) into a recovery drum and label for proper disposal.

4.0 TRAINING

It is the policy of Robinson Brothers Construction, Inc. that all employees will be instructed on the proper response procedures for spilled materials and proper spill prevention and response procedures. The following procedures will be carried out in the event of a spill.

5.0 PROCEDURE

5.1 1.1 Substance Identification

It is the determination of Robinson Brothers Construction, Inc. to ensure that all chemicals used that may be potentially spilled or released are kept on the chemicals with a potential spill or release list. The chemicals list will consist of both liquid chemicals used at the facilities of Robinson Brothers Construction, Inc. or brought on to the sites of the owner client.

5.2 Spill Kits

It is the policy of Robinson Brothers Construction, Inc. that spill kits must contain the appropriate supplies for the materials that may be spilled. The supplies will be easily accessible when required, and considerations will be made for both the type and quantity of materials. Spill kits will consist of but not limited to the following:

- 10 white absorbents for oil,
- Vermiculite or another absorbent,
- 10 gray absorbents for all chemical spills,
- Broom and pan,
- Plastic bags with waste labels,
- Personnel protective equipment (gloves, goggles, dust/mist mask), and
- 6-gallon empty recovery drum.

It is the determination of Robinson Brothers Construction, Inc. to ensure the availability of adequate spill response supplies by periodic inspection to assess their availability and adjust inventory as necessary.

5.3 Immediately Contact CSO

At all times, there will be one person on call (and available to respond to an emergency, who will be responsible for coordinating all hazardous waste emergency response measures.

- This individual will be designated the Emergency Coordinator and will have the authority to mobilize all resources necessary to carry out procedures outlined in the plan.
- All hazardous waste generating operations and activities at the location and characteristics of hazardous waste, the location of records, and location of all emergency response and spill cleanup and control equipment.
- In the event of a hazardous waste release the Emergency Coordinator, or alternate, must be contacted immediately.
- A mobile communication system (i.e., telephone, radio, walkie-talkie, or cellular phone) will be available near the storage locations during transfer operations. If fuel delivery trucks are equipped with a communication system, that will be considered adequate means for emergency communication.

5.4 Emergency Coordinator Assumes Control

The Emergency Coordinator must be informed of the nature and location of the spill and will direct the resources of manpower and equipment for the spill response action. The emergency coordinator shall remain in control for the duration of the response.

5.5 The Need of Outside Support (Larger Spills)

The Emergency Coordinator, or individual directed by the Emergency Coordinator, will make the necessary contact with outside support and regulatory agencies such as a Larger Spills Contractor.

- In the event of an incident involving a large spill (greater than 1 gallon of hazardous material or 1 pint of acutely hazardous),
- ***Alert the Emergency Coordinator***—The Emergency Coordinator will immediately notify the Environmental Health and Safety Department,
- The Emergency Coordinator will summon additional assistance, if necessary (local or state emergency response teams, Fire Depts., etc.)

5.6 Disposal of Spill Materials Oil Spill Waste

Oil Spill Waste will be cleaned up using spill absorbent material and drummed for off--- site disposal. The free liquid is pumped into UN approved 30 or 55---gallon drums. The Environmental Protection Division using approved System Vendor disposes of waste generated.

5.7 Hazardous Waste Releases

The emergency coordinator must, immediately after an emergency, provide for the treatment, storage, or disposal of recovered waste, contaminated soil or surface water, or any other material that results from a fire, explosion, or other release at the facility.

5.8 Housekeeping

It is the policy of Robinson Brothers Construction, Inc. that areas, where chemicals may be used or stored, must be maintained using good housekeeping best management practices. This includes, but is not limited to proper storage of chemicals to minimize the potential for a spill, clean and organized storage, labeling, and secondary containment where necessary.

Note: Stored chemicals, so they are not exposed to stormwater.

5.9 Communication Measures

The following emergency contacts will be summoned by telephone or directly in the event of a spill of any quantity that is either indoors or outdoors.

Emergency Contact Numbers will be posted at telephones located throughout the facility. The following information should be provided when reporting a spill:

- Identity of the caller,
- Contact phone number,
- Location of spill,
- Type of product spilled,
- Quantity spilled,
- Extent of actual and/or potential water pollution,
- Date and time of spill, and
- The cause of the spill.

5.10 Inspections

The Contractor will regularly inspect all storage facilities (not less than weekly) and record the condition of the facility in a weekly log.

In addition to inspection items discussed in previous sections, inspections will include the outside of all containers for signs of deterioration, discharges, or accumulation of oil inside containment structures or dikes

Inspections will also include all aboveground valves, piping appurtenances and the general condition of items such as flange joints, expansion joints, valve glands and bodies, pipe supports, and metal surfaces.

6.0 RECORDKEEPING

Record the inspection condition of the facility in a weekly log. In addition to the weekly log, the Contractor will maintain records for hazardous materials and hazardous wastes, as required by all applicable federal, state, and local regulations and permit conditions. Record-keeping requirements include, at a minimum:

- Hazardous materials/Waste inspection log,
- Transportation documents,
- Bills of lading,
- Manifests,
- Shipping papers,
- Training records,
- Release report forms, and
- Spill history and documentation of clean-up/handling.

The Environmental Inspector will monitor, inspect, document and report on the Contractor's compliance with hazardous materials and hazardous waste management practices. Inspection records will be kept with the SPCC Plan for at least three years.

7.0 REFERENCES

1.	**Documents & External References** https://mn.gov/commerce/energyfacilities/documents/19133/Appendix%20C%20Spill%20Prevention.pdf, http://elkhornconstruction.com/elkdocs/Safety/Policies%20and%20Procedures/spill%20prevention%20and%20response.pdf,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

The purpose of this program is to ensure that Robinson Brothers Construction, Inc. continues to improve subcontractor health, safety, and environmental performance and to establish a standard for pre-qualification, evaluation/selection and development of our subcontractors.

1.1 Scope

This program applies to all subcontractors and all Robinson Brothers Construction, Inc. locations.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
None	None.

2.1 Responsibilities

2.1.1 Subcontractor Responsibilities

The responsibilities of the Subcontractor are to:

- Be willing to watch and listen to the Mentor,
- Establish a positive safety attitude toward assigned job tasks,
- Learn how to create and follow JSAs,
- Be willing to learn how to do each task in a safe and environmentally sound manner,
- Stop and report unsafe conditions immediately,
- Participate in safety meetings, and
- Follow all safety rules and company policies.

2.1.2 HSE Coordinator Responsibilities

The responsibilities of the HSE Coordinator in the Subcontractor Program are to:

- Serve as subject matter resource to support the supervisor and Subcontractor,
- Ensure the Subcontractor gets the necessary safety training,
- Monitored Subcontractor employees for compliance with policies and procedures, and
- Follow all policies and procedures.

3.0 SAFETY

3.1 Subcontractor Quality Assessment and Control

- Management should review the effectiveness and quality of the Subcontractor Program at least annually.
- Subcontractor Site, Specific Orientation and Training documentation, should be audited for accuracy, timeliness, and completeness.
- Onsite inspections should be conducted to ensure that supervisors, mentors, and Subcontractor are adhering to the Subcontractor Program.
- The number of incidents involving new employees should be measured, compared to the general workforce and evaluated for trends or performance variations.
- Management should ensure that all program deficiencies are promptly corrected and documented

4.0 TRAINING

a. Site Specific Orientation

- Management will provide a company-approved Site-Specific Orientation.
- Each Subcontractor will be required to have the Site-Specific Orientation.
- Each Subcontractor will be taught how to access company policies, standards, and procedures.
- Satisfactory completion of the Site-Specific Orientation must be signed and dated by the employee and supervisor.

5.0 PROCEDURE

5.1 General Requirements

The use of subcontractors must be pre-approved by Robinson Brothers Construction, Inc.. Approval requirements include:

- A formal safety review of the subcontractor being performed by Robinson Brothers Construction, Inc. safety department.
- The scope of the review was commensurate with the hazards and risk exposure.
- The subcontractor has been/will be oriented to the safety policies, expectations, and requirements of Robinson Brothers Construction, Inc..
- The subcontractor agrees to abide by our Drug and Alcohol policy and onsite safety rules throughout the duration of the work.
- Any subcontractor that has a “Non-Approved” safety status will not be used on any Robinson Brothers Construction, Inc. site.

5.1.1 Pre-Qualification of Subcontractors

Subcontractors will be pre-qualified by reviewing their safety programs, safety training documents, and safety statistics.

5.1.2 Evaluation Safety Metrics

Acceptable safety metrics will be used as criteria for prequalifying and selecting subcontractors. The safety metrics and scoring will consider:

- Robinson Brothers Construction, Inc. Subcontractor Safety Pre-Qualification Form responses and subcontractor safety program documents review 60% (Rated from 0-60 total points)
- Subcontractor safety training documents review 20% (Rated from 0-20 total points)
- Subcontractor safety statistics review 20% (Rated from 0-20 total points)

5.1.3 Evaluation Rating and Acceptance

- The subcontractor rating system will have five designations:
- Equal to or Greater than 90 points = A – no restrictions.
- Between 85 and 89 points = B – Mitigation plan must be documented and approved by Robinson Brothers Construction, Inc. Safety.
- Between 81 and 84 points = C – Mitigation plan must be documented and approved by Robinson Brothers Construction, Inc. Safety; management approval in writing.
- Between 71 and 80 points = D – Mandatory commitment meeting with senior subcontractor management present; mitigation plan documented and approved by Robinson Brothers Construction, Inc. Safety Management approval in writing, trained subcontractor safety personnel on site during work regardless of the number of workers.
- Less than 70 points = F – not to be used.

Once each subcontractor has been evaluated and scored, Robinson Brothers Construction, Inc. safety will provide management the scores/ranking.

Robinson Brothers Construction, Inc. reserves the right to change a subcontractor's status to "Non-Approved" if the subcontractor shows insufficient progress towards accepted mitigation plan or other agreed upon criteria.

5.2 Subcontractor Involvement

Contractors are required to follow or implement the work practices and systems described below while performing work at Robinson Brothers Construction, Inc. worksites:

- Attend a safety orientation, pre-job meeting or kick-off meeting provided by Robinson Brothers Construction, Inc. prior to any work beginning,
- Monitor employees for substance abuse and report nonconformities to Robinson Brothers Construction, Inc.,
- Ensure personnel have the required training and competency for their work, and
- Participate in Robinson Brothers Construction, Inc. tailgate safety meetings, job safety analysis or hazard assessments and on the job safety inspections:
  - ❖ Perform a pre-job safety inspection that includes equipment
  - ❖ Participate in the BBS hazard reporting system
  - ❖ Report all injuries, spills, property damage incidents and near misses

- ❖ Comply with onsite and Owner Client safety rules
- ❖ Implement Robinson Brothers Construction, Inc. safety practices and processes as applicable
- ❖ Clean up and restore the work site after the job is over
- ❖ Ensure compliance with regulations at all times
- ❖ Post job safety performance reviews shall be conducted for subcontractors.

6.0 RECORDKEEPING

The following information is maintained as a result of this process:

- The Safety Director is responsible for maintenance of training records, and these records will be maintained at a local location, specifically, the Safety Director's office.
- Documentation of training will be furnished to those employees whose work location varies.
- Qualifications of the instructors providing training must also be documented.

All training must be documented with:

- Date,
- Employee name,
- Employee signature,
- Instructor name,
- Instructor signature, and
- The title of the course

7.0 REFERENCES

1.	**Documents & External References** https://static.secure.website/wscfus/10059200/5111256/safety-manual-section-26-subcontractor-management.pdf, elkhornconstruction.com/elkdocs/Safety/SubcontractorManagementPlan.doc.

8.0 REVISION INFORMATION

This is applicable to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

Appendix 1: Subcontractor Safety Pre-Qualification Form (example only)

SUBCONTRACTOR SAFETY PRE-QUALIFICATION FORM (example only)

GENERAL INFORMATION		
1. Subcontractor Information:		
Subcontractor Name:	Telephone Number:	
Street Address:	Fax Number:	
City:	Province/State:	Postal Code/Zip:
Website Address:		
2. Officers		
President:		
Vice President:		
Treasurer:		
3. How many years has your organization been in business under your present firm's name?		
4. Parent Firm Name:		
City:	Province/State:	Postal Code/Zip:
Subsidiaries:		
5. Contractor Evaluation form completed by:		
Title:	Telephone:	
Fax:	Email:	

HEALTH, SAFETY AND ENVIRONMENTAL PERFORMANCE

Health, Safety and Environmental Performance

Provide the following data for your firm using your record keeping forms from the past three (3) years.
If the data is not available, please reply with Not Available - N/A.

Safety Performance Definitions and Guidance

a. **Hours Worked** Employee hours worked last three years. Please report actual scheduled total hours worked and total overtime hours worked. If actual hours worked are not available for certain individual's hours worked may be estimated. A default of 2000 hours per individual per year can be used as an estimate.

b. **Recordable Incidents** Recordable cases are those that involve any work-related injury or illness, including death but excluding first-aid injuries.

c. **Lost Workday Cases** a Lost Workday Case is a medical case that involves fatalities, days away from work cases or restricted work activity cases.

- **Days Away from Work Case** Where the employee is away from scheduled work day one day or more after the day of a work-related injury or illness. The day of the incident does not count as lost workday. Stop count when total days away and restricted duty days reach 180 or employee leaves the firm.
- **Restricted Work Activity Case** Where the employee as result of work-related injury or illness:
  - ◊ Assigned to another job on a temporary or permanent basis or
  - ◊ Worked at their permanent job but less than a full day
  - ◊ Could not perform routine functions associated with their permanent job

  The day of the incident is not counted as a Restricted Duty day. Stop count when total days away or restricted duty days reach 180 or if an employee leaves the firm.

d. **Motor Vehicle Incident** A motor vehicle is any mechanically or electrically powered devices (excluding one moved by human power), upon which or by which any person or property may be transported upon a land roadway.

- **Motor Vehicle Incident** Includes any event involving a motor vehicle that is owned, leased or rented by the firm that results in death, injury or property damage unless the vehicle is properly parked.

Health and Safety Incidents	**2009**	**2008**	**2007**
a. Total Hours Worked			
b. Total Recordable Incidents # Fatalities # Medical Aids # Days Away from Work Cases # Restricted Work Activity Cases			
c. Total Recordable Incident Rate (TRIR) Total # Recordable Incidents x 200,000 Total # Hours worked			
d. Lost Workday Cases (LWC) # Fatalities # Days Away from Work Case # Restricted Work Activity Case			
e. Lost Workday Incident Rate (LWDR) Total # Lost Workday Incidents x 200,000 Total # Hours Worked			

HEALTH, SAFETY AND ENVIRONMENTAL PERFORMANCE			
Health and Safety Incidents - continued	**2009**	**2008**	**2007**
f. Motor Vehicle Incidents (MVI) # Motor Vehicles Incidents # Kilometers/Miles driven			
g. Motor Vehicle Incident Frequency Rate (MVIFR) Total # of Firm's Motor Vehicle Incidents x 1,000,000 Total # Kilometers/Miles driven			
Environmental Incidents	**2009**	**2008**	**2007**
Total # Spills to Water **a. Petroleum Spills** # spills Sheen (est. volume as 0.1 bbl. To < 1bbl. # spills 1 bbl. To < 100 bbls. # spills 100 bbls. or more **b. Chemical Spills** # spills 1 bbl./160 kg. to < 100 bbls. /16,000 kg. # spills 100 bbls. /16,000 or more			
Total # Spills to Land **a. Petroleum spills** # spills 1 bbl. To < 100 bbls. # spills 100 bbls. or more **b. Chemical Spills** # spills 1 bbl./160 kg. to < 50 bbls./8,000 kg # spills 50 bbls./8,000 kg. or more			
Enforcement Actions	**2009**	**2008**	**2007**
Citations # Health and Safety # Environmental Please provide details			
Fines Total # Fines Total $$ Paid Please provide details			

HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT		
Highest ranking HSE professional in the firm: Name/Title: Email: Telephone Numbers		
Do you have a written Basic Safety / HSE Program?	Yes ☐	No ☐
Does your Basic Safety/HSE Program include the following?		
a. HSE Policy statement signed by management	Yes ☐	No ☐
b. Management Involvement and Commitment	Yes ☐	No ☐
c. Hazard Identification and Risk Control	Yes ☐	No ☐
d. Rules and Work Procedures	Yes ☐	No ☐
e. Training	Yes ☐	No ☐
f. Communications	Yes ☐	No ☐
g. Incident and Accident Reporting and Investigation	Yes ☐	No ☐
Does the program include work practices and procedures such as?		
a. Permit to Work including Isolation of Energy	Yes ☐	No ☐
b. Confined Space Entry	Yes ☐	No ☐
c. Injury and Illness Recording	Yes ☐	No ☐
d. Fall Protection	Yes ☐	No ☐
e. Personal Protective Equipment	Yes ☐	No ☐
f. Portable Electrical/Power Tools	Yes ☐	No ☐
g. Motor Vehicle/Driving Safety	Yes ☐	No ☐
h. Compressed Gas Cylinders	Yes ☐	No ☐
i. Electrical Equipment Grounding Assurance	Yes ☐	No ☐
j. Powered Industrial Vehicles (Cranes, Forklifts, Etc.)	Yes ☐	No ☐
k. Housekeeping	Yes ☐	No ☐
l. Accident/Incident Reporting and Investigations	Yes ☐	No ☐
m. Unsafe Condition Reporting	Yes ☐	No ☐
n. Emergency Preparedness, Including Evacuation Plan	Yes ☐	No ☐
o. Waste Disposal and Pollution Prevention	Yes ☐	No ☐
p. Regular Workplace Inspection / Audits	Yes ☐	No ☐
Do you have a Drug and Alcohol program?	Yes ☐	No ☐
a. Pre-employment Testing	Yes ☐	No ☐
b. Reasonable Cause Testing	Yes ☐	No ☐
c. Post-rehabilitation/Return to Work Testing	Yes ☐	No ☐

Do you have a Job Safety Analysis (JSA) process in place?		Yes ☐	No ☐
Is there a Root Cause Analysis process used for investigations, near misses, environmental spills?		Yes ☐	No ☐
Is there a Management of Change (MOC) Process in place?		Yes ☐	No ☐
Do you have programs for the following?			
a. Respiratory Protection		Yes ☐	No ☐
b. Where applicable, have employees been:			
• Trained		Yes ☐	No ☐
• Fit tested		Yes ☐	No ☐
• Medically approved		Yes ☐	No ☐
c. Hazard communication/WHMIS		Yes ☐	No ☐
d. Programs for potential high hazard work such as Highly Hazardous Chemicals; Explosives and Blasting Agents		Yes ☐	No ☐
Do you have a corrective action process for addressing individual/employee safety and health performance deficiencies?		Yes ☐	No ☐
Medical			
a. Do you conduct medical examinations for:			
• Pre-placement Job Capability		Yes ☐	No ☐
• Pulmonary		Yes ☐	No ☐
• Respiratory		Yes ☐	No ☐
b. Describe how you intend to provide first aid and other medical services while on-site.			
Do you have personnel trained to perform first aid and CPR?		Yes ☐	No ☐
Personal Protective Equipment (PPE)			
a. Is applicable PPE provided for employees?		Yes ☐	No ☐
b. Do you have a program to assure that PPE is inspected and maintained?		Yes ☐	No ☐
HSE Meetings			**Frequency**
a. Do you hold site HSE meetings for?			
• Field Supervisors	Yes ☐	No ☐	
• Employees	Yes ☐	No ☐	
• New Hires	Yes ☐	No ☐	
• Subcontractors	Yes ☐	No ☐	

Inspections and Audits			Frequency
HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT			
a. Do you conduct internal HSE Inspections?	Yes ☐	No ☐	
b. Do you conduct internal HSE program audits?	Yes ☐	No ☐	
c. Are corrections or deficiencies to internal HSE program or equipment communicated and documented until closure?	Yes ☐	No ☐	
Equipment and Materials:			
a. Do you own or lease Equipment and Materials? If yes, please complete the following questions:		Yes ☐	No ☐
b. Do you have a system for establishing applicable health, safety, and environmental specifications for the acquisition of materials and equipment?		Yes ☐	No ☐
c. Do you conduct inspections on operating equipment (e.g., cranes, forklifts) in compliance with regulatory requirements?		Yes ☐	No ☐
d. Do you maintain operating equipment in compliance with regulatory requirements?		Yes ☐	No ☐
e. Do you maintain the applicable inspection and maintenance certification records for operating equipment?		Yes ☐	No ☐
f. Do you document corrections or deficiencies from equipment inspections and maintenance?		Yes ☐	No ☐
Subcontractor Management			
a. Do you subcontract any work? If the answer is yes, please complete the following questions:		Yes ☐	No ☒
b. Do you have a written contractor safety management process?		Yes ☐	No ☐
c. Do you use HSE performance criteria in the selection of subcontractors?		Yes ☐	No ☐
d. Do you evaluate the ability of subcontractors to comply with applicable HSE requirements as part of the selection process?		Yes ☐	No ☐
e. Do your subcontractors have a written HSE Program?		Yes ☐	No ☐
f. Do you include your subcontractors in:			
• HSE Orientation		Yes ☐	No ☐
• HSE Meetings		Yes ☐	No ☐
• HSE Equipment Inspections		Yes ☐	No ☐
• HSE Program Audits		Yes ☐	No ☐
• Are corrections or deficiencies documented		Yes ☐	No ☐

HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT

Employee and Trades Training

a.	Have employees been trained in appropriate job skills?	Yes ☐	No ☐
b.	Are employees' job skills certified where required by regulatory or industry consensus standards?	Yes ☐	No ☐
c.	List trades/crafts which have been certified:		

Health, Safety and Environmental Orientation

		New Hires		Supervisors	
a.	Do you have an HSE Orientation Program for new hires and newly hired or promoted supervisors?	Yes ☐	No ☐	Yes ☐	No ☐
b.	Does the program provide instruction on the following:				
	•New worker orientation	Yes ☐	No ☐	Yes ☐	No ☐
	•Safe Work Practices	Yes ☐	No ☐	Yes ☐	No ☐
	•Safety Supervision	Yes ☐	No ☐	Yes ☐	No ☐
	•Toolbox meetings	Yes ☐	No ☐	Yes ☐	No ☐
	•Emergency Procedures	Yes ☐	No ☐	Yes ☐	No ☐
	•First Aid Procedures	Yes ☐	No ☐	Yes ☐	No ☐
	•Fire Protection and Prevention	Yes ☐	No ☐	Yes ☐	No ☐
	•Safety Intervention	Yes ☐	No ☐	Yes ☐	No ☐
	•Hazard Communication/WHMIS	Yes ☐	No ☐	Yes ☐	No ☐

Health, Safety and Environmental Training

a.	Do you know the regulatory HSE training requirements for your employees?	Yes ☐	No ☐
b.	Have your employees received the required HSE training and re-training	Yes ☐	No ☐
c.	Do you have a specific HSE training program for supervisors?	Yes ☐	No ☐

Training Records

a.	Do you have HSE and training records for your Employee's?	Yes ☐	No ☐
b.	Do the training records include the following:		
	• Employee identification	Yes ☐	No ☐
	• Date of training	Yes ☐	No ☐
	• Name of trainer	Yes ☐	No ☐
	• Method used to verify understanding	Yes ☐	No ☐

c. How do you verify understanding of training? (Check all that apply)

☐ Written test ☐ Oral test ☐ Performance test ☐ Job Monitoring ☐ Other (List)

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

This program outlines procedures and guidelines for the protection of employees working in and around excavations and trenches. This program requires compliance with *OSHA Standards described in Subpart P (29 CFR 1926.650)* for the construction industry.

1.1 Scope

This program is intended to assist Robinson Brothers Construction, Inc.'s employee's and contractor's protection when working in or around excavations. Also, in their knowledge of trenching and shoring and the prevention of hazards.

2.0 DEFINITIONS

Term	Description / Explanation
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.
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.
Duration of Exposure	The longer an excavation is open, the longer the other factors have to work on causing it to collapse.
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 from 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 Loads	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
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.

2.1 Responsibilities

It is the responsibility of each superintendent and supervisor to implement and maintain the procedures and steps set forth in this program. Each employee involved with excavation and trenching work is responsible to comply with all applicable safety procedures and requirements of this program.

2.2 Competent Person

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.

2.2.1 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 proper utility companies have been contacted.
- Conduct soil classification tests and reclassify soil after any condition changes.
- Determine adequate protective systems (sloping, shoring, or shielding systems) for employee protection.
- Conduct all air monitoring for potential hazardous atmospheres.
- Conduct daily and periodic inspections of excavations and trenches.
- Approve design of structural ramps, if used.

3.0 SAFETY

3.1 Protective Systems

There are different types of protective systems:

a. Guardrails

Are installed for crossings and walkways to protect against falls.

b. Benching

Is a method of protecting workers 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. *Benching cannot be done in Type C soil.*

c. Sloping

Involves cutting back the trench wall at an angle inclined away from the excavation.

d. Shoring

Requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins.

e. Shielding

Protects workers by using trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, accumulation water content of soil, changes caused by weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

Employees must be protected from water accumulation, including the use of shields, and must be inspected by a competent person before work begins.

3.2 Personal Protective Equipment

It is company policy to wear a hard hat, safety glasses, and work boots on the jobsite. Because of the hazards involved with excavations, other personal protective equipment may be necessary, depending on the potential hazards present (examples -goggles, gloves, and respiratory equipment).

4.0 TRAINING

The competent person(s) must be trained in accordance with the OSHA Excavation Standard, and all other programs that may apply (examples Hazard Communication, Confined Space, and Respiratory Protection), and must demonstrate a thorough understanding and knowledge of the programs and the hazards associated.

All other employees working in and around the excavation must be trained in the recognition of hazards associated with trenching and excavating

5.0 PROCEDURE

5.1 Trenching and Excavation

The employer must comply with the trenching and excavation requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.

An excavation is any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.

Trench (Trench excavation) means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 meters).

5.2 Dangers of Trenching and Excavation

Cave-ins pose the greatest risk and are much more likely than other excavation-related accidents to result in worker fatalities. Other potential hazards include falls, falling loads, hazardous atmospheres, and incidents involving mobile equipment. One cubic yard of soil can weigh as much as a car. An unprotected trench is an early grave. Do not enter an unprotected trench.

5.3 Trench Safety Measures

Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required.

Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c).

5.4 Excavated Spoils

Employees need to be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations.

This protection can be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

5.5 Competent Person

OSHA standards require that employers inspect trenches daily and as conditions change by a competent person before worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary, or dangerous to workers, soil types and protective systems required, and who is authorized to take prompt corrective measures to eliminate these hazards and conditions.

5.6 Access and Egress

- Trench excavations shall have ramps, ladders, stairs, etc.; the means of egress must be within 25 feet of lateral travel for employees. There must be a clear path of no more than 25 ft. for a worker to exit the excavation.
- Safe access and egress to all excavations, including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet (1.22 meters) or deeper.
- These devices must be located within 25 feet (7.6 meters) of all workers.

5.7 General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Identify other sources that might affect trench stability.
- Keep excavated soil (spoils) and other materials at least 2 feet (0.6 meters) from trench edges.
- Ensure underground utilities are located and marked before digging.
- Test for atmospheric hazards such as low oxygen, hazardous fumes, and toxic gasses when > 4 feet deep.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm or other water intrusion.
- Do not work under suspended or raised loads and materials.
- Inspect trenches after any occurrence that could have changed conditions in the trench.

- Ensure that personnel wear high visibility or other suitable clothing when exposed to vehicular traffic.

5.7.1 Inspections

Daily inspection 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 cave-in, indications of failure of protective systems, hazardous atmospheres or other hazardous conditions.

- All inspections shall be conducted by the competent person prior to the start of work and as needed throughout the shift.
- Inspections will be made after every rainstorm or any other increasing hazard.
- All documented inspections will be kept on file in the jobsite safety files and forwarded to the Safety Director weekly.

5.8 Soil Classification and Identification

The OSHA Standards define soil classifications within the Simplified Soil Classification Systems, which consist 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 Standard provides soil mechanics terms and types of field tests used to determine soil classifications.

Stable rock is defined as natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

a. Type A soil is defined as:

- Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot (TSF) or greater.
- Cemented soils like caliche and hardpan are considered Type A.

b. Soil is NOT Type A if:

- It is fissured.
- The soil is subject to vibration from heavy traffic, pile driving or similar effects.
- The soil has been previously disturbed.
- The material is subject to other factors that would require it to be classified as a less stable material.
- The exclusions for Type A most generally eliminate it from most construction situations.

c. Type B soil is defined as:

- Cohesive soil with an unconfined compressive strength greater than .5 TSF, but less than 1.5 TSF.
- Granular cohesionless soil including angular gravel, silt, silt loam, and sandy loam.

- The soil has been previously disturbed except that soil classified as Type C soil.
- Soil that meets the unconfined compressive strength requirements of Type A soil, but is fissured or subject to vibration.
- Dry rock that is unstable.

d. Type C soil is defined as:

- Cohesive soil with an unconfined compressive strength of (.5 TSF) or less.
- Granular soils including gravel, sand and loamy sand.
- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.

5.9 Soil Test & Identification

The competent person will classify the soil type in accordance with the definitions in Appendix A on the basis of at least one visual and one manual analysis. These tests should be run on freshly excavated samples from the excavation and are designed to determine stability based on a number of criteria: the cohesiveness, the presence of fissures, the presence and amount of water, the unconfined compressive strength, the duration of exposure, undermining, and the presence of layering, prior excavation and vibration.

The cohesion tests are based on methods to determine the presence of clay. Clay, silt, and sand are size classifications, with clay being the smallest sized particles, silt intermediate and sand the largest. Clay minerals exhibit good cohesion and plasticity (can be molded). Sand exhibits no elasticity and virtually no cohesion unless surface wetting is present. The degree of cohesiveness and plasticity depend on the amounts of all three types and water.

When examining the soil, three questions must be asked:

1. Is the sample granular or cohesive?
2. Fissured or non-fissured?
3. What is the unconfined compressive strength measured in TSF?

5.9.1 Methods of testing soils:

a. Visual test:

If the excavated soil is in clumps, it is cohesive. If it breaks up easily, not staying in clumps, it is granular.

b. Wet manual test:

Wet your fingers and work the soil between them. Clay is a slick paste when wet, meaning it is cohesive. If the clump falls apart in grains, it is granular.

c. Dry strength test:

Try to crumble the sample in your hands with your fingers. If it crumbles into grains, it is granular. Clay will not crumble into grains, only into smaller chunks.

d. Pocket penetrometer test:

This instrument is most accurate when soil is nearly saturated. This instrument will give unconfined compressive strength in tons per square foot. The spring-operated device uses a piston that is pushed into a coil up to a calibration groove. An indicator sleeve marks and retains the reading until it is read. The reading is calibrated in tons per square foot (TSF) or kilograms per cubic centimeter.

e. Thumb penetration teal:

The competent person attempts to penetrate a fresh sample with thumb pressure. If the sample can be dented, but penetrated only with great effort, it is Type A.

If it can be penetrated several inches and molded by light pressure, it is Type C. Type B can be penetrated with effort and molded.

f. Shear Vane (Torvane):

Measures the approximate shear strength of saturated cohesive soils. The blades of the vane are pressed into a flat section of undisturbed soil, and the knob is turned slowly until soil failure. The dial is read directly when using the standard vane. The results will be in tons per square foot or kilograms per cubic centimeter.

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.

6.0 RECORDKEEPING

The following information for Trenching and Shoring is maintained as a result of this process:

- Excavation, Trenching, and Shoring Checklists shall be maintained for at least one year by the Robinson Brothers Construction, Inc. and shall be available for inspection by employees and their authorized representatives.
- Training records shall include sign in sheets with each employee's name (printed), signature, ID #, and date of the training.
- This written program shall be available for all employees to review

Storage time requirements range between 1, 3, and 5 years. Check the specific regulations that apply to your industry, but as "Best Practice," store safety and training records for 5 years.

7.0 REFERENCES

1.	**Documents & External References** https://www.osha.gov/OshDoc/data_Hurricane_Facts/trench_excavation_fs.pdf, https://www.osha.gov/Publications/osha2226.pdf, Subpart P, *Excavations*, of 29 CFR 1926.650, 29 CFR 1926.651, and 29 CFR 1926.652,

8.0 REVISION INFORMATION

This is applicable to changes made to the current version from the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.

TABLE OF CONTENTS

AUTHORIZATION

APPROVED BY:
Name & Title

1.0 PURPOSE

Welding and Hot Work, such as brazing or grinding present a significant opportunity for fire and injury. All precautions of this program must be applied prior to commencing any welding or hot work by company employees or contractors.

1.1 SCOPE

This procedure applies to all Robinson Brothers Construction, Inc. employees and subcontractors. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Robinson Brothers Construction, Inc. employees and contractors and shall be used on owned premises, or when an operator's program does not exist or is less stringent.

2.0 DEFINITIONS

Definitions below are specific to this document.

Term	Description / Explanation
Welding/Hot Works Procedures	Any activity which results in sparks, fire, molten slag, or hot material which has the potential to cause fires or explosions.
Examples of Hot Works:	Cutting, Brazing, Soldering, Thawing Pipes, Torch Applied Roofing, Grinding and Welding.
Special Hazard Occupancies:	Any area containing Flammable Liquids, Dust Accumulation, Gases, Plastics, Rubber and Paper Products

2.1 Responsibilities

2.1.1 Management

- Provide training for all employees whose task include heat, spark or flame producing operations such as welding, brazing, or grinding.
- Develop and monitor effective hot work procedures.
- Provide safe equipment for hot work.
- Provide ventilation and/or respiratory equipment is used when hazardous fumes/gases or dust may be present.
- Provide proper and effective PPE for all hot work.

2.1.2 Supervisors

- Monitor all hot work operations.
- Ensure all hot work equipment and PPE are in safe working order.
- Ensure defective hot work equipment is removed from service.

- Allow only trained and authorized employees to conduct hot work.
- Ensure permits are used for all hot work outside authorized areas.

2.1.3 Employees

- Ensure that hot work activities must not be performed if it is unsafe to do so.
- Follow all hot work procedures.
- Properly use appropriate hot work PPE.
- Inspect all hot work equipment before use.
- Report any equipment problems.
- Not use damaged hot work equipment.

3.0 SAFETY

3.1 Hazards

- Fires & Explosions.
- Skin burns.
- Welding "blindness."
- Respiratory hazards from fumes & smoke.

3.2 Personal Protection

- Helmets and hand shields shall be made of material, which is an insulator for heat and electricity.
- Helmets, shields, and goggles shall not be readily flammable and shall be capable of withstanding sterilization.
- Helmets and hand shields shall be arranged to protect the face, neck, and ears from direct radiant energy from the arc.
- Helmets shall be provided with filter plates and cover plates designed for easy removal.
- All parts shall be constructed of material, which will not readily corrode or discolor the skin.
- Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.
- All glass for lenses shall be tempered, substantially free from scratches, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical vision correction, the front and rear surfaces of lenses and windows shall be smooth and parallel.
- Lenses shall bear some permanent distinctive marking which may readily identify the source and shade.
- Adequate hand protection and clothing must be used to protect the body from welding hazards.

3.2.1 First Aid Equipment

First aid equipment shall be available at all times. All injuries shall be reported as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided.

4.0 TRAINING

All affected employee including welders/cutters and Fire Watch employees are provided Hot Work training. Training shall include:

- Review of requirements listed in OSHA 1910.252.
- Use of Hot Works Permit System.
- Supervisor Responsibilities.
- Fire Watch Responsibilities - specifically, the fire watch must know:
  - ❖ That their ONLY duty is Fire Watch.
  - ❖ When they can terminate the watch.
  - ❖ How to use the provided fire extinguisher.
  - ❖ How to activate fire alarm if the fire is beyond the incipient stage.
- Operator Responsibilities.
- Contractors Responsibilities.
- Documentation requirements.
- Respirator Usage requirements.
- Fire Extinguisher training.

5.0 PROCEDURE

5.1 Hot Works Procedures

OSHA 29 CFR 1910.252 required fire prevention actions for welding/hot works.

Where practicable all combustibles shall be relocated at least 35 feet from the work site. Where relocation is impractical, combustibles shall be protected with flame-proof covers, shielded with metal, guards, curtains, or wet down material to help prevent ignition of material.

- Ducts, conveyor systems, and augers that might carry sparks to distant combustibles shall be protected or shut down.
- Where cutting or welding is done near walls, partitions, ceilings, or a roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.
- If welding is to be done on a metal wall, partition, ceiling, or roof, precautions shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation of heat. Where combustibles cannot be relocated on the opposite side of the work, a fire watch person shall be required on the opposite side of the work.
- Welding shall not be attempted on a metal partition, wall, ceiling or roof having a covering nor on walls having combustible sandwich panel construction.

Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings, or roofs shall not be undertaken if the work is close enough to cause ignition by combustion. Cutting or welding shall not be permitted in the following situations:

- In areas not authorized by management.

- In sprinkled buildings, while such protection is impaired.
- In the presence of potentially explosive atmospheres, e.g. a flammable
- In areas near the storage of large quantities of exposed, readily ignitable materials.
- In areas where there is dust accumulation of greater than 1/16 inch within 35 feet of the area where welding/hot works will be conducted. *All dust accumulation should be cleaned up following the housekeeping program of the facility before welding/hot works are permitted.*
    - ❖ Suitable extinguishers shall be provided and maintained and shall be readily available, ready for instant use.
    - ❖ The fire watch shall be provided during and for a minimum of 1/2 hour past the completion of the welding project.
    - ❖ A cutting/welding permit will be issued on all welding or cutting outside of the designated welding area.

5.2 Welding & Hot Work Fire Prevention Measures

A designated welding area should be established to meet them following requirements:

- Floors swept and clean of combustibles within 35 ft. of the work area.
- Flammable and combustible liquids and material will be kept 35 ft. from work area.
- Adequate ventilation providing 20 air changes per hour, such as a suction hood system should be provided to the work area.
- At least one 10 lb. Dry chemical fire extinguisher should be within access of the 35 ft. of the work area.
- Protective dividers such as welding curtains or non-combustible walls will be provided to contain sparks and slag to the combustible free area.

5.2.1 Requirements for Welding Conducted Outside the Designated Welding Area

- Portable welding curtains or shields must be used to protect other workers in the welding area.
- A hot works permit must be completed and complied with prior to the welding operation.
- Respiratory protection is mandatory unless an adequate monitored air flow away from the welder and others present can be established and maintained.
- Plastic materials be covered with welding tarps during welding procedures
- Fire Watch is required for all hot work operations.

5.3 Welding Standard Operating Procedures

The following pages list the *Welding Standard Operating Procedures* (SOP) and are applicable for all electric and gas welding. These SOPs are to be posted at each Designated Welding & Hot Work Area for quick reference and review.

5.3.1 SOP - Electric Welding

<u>Perform Safety Check on all equipment</u>

- Ensure fire extinguisher is charged and readily available

- Ensure electrical cord, electrode holder and cables are free from defects (no cable splices are allowed within 10 feet of the electrode holder.
- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- Ensure the welding unit is properly grounded.
- All defective equipment must be repaired or replaced before use.

Remove flammables and combustibles

- No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.
- Place welding screen or suitable barricade around the work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation).

✓ **Ensure Adequate Ventilation and Lighting**
✓ **Execute Hot Work Permit procedures**
✓ **Set Voltage Regulator**

No higher than the following for:

- Manual Alternating Current Welders - 80 volts
- Automatic Alternating Current Welders - 100 volts
- Manual or automatic Direct Current Welders -100 volts

Uncoil and spread out welding cable

To avoid overheating, ensure proper contact of work leads and connections, remove any metal fragments from magnetic work clamps (to avoid electric shock do not wrap welding cables around a body part and avoid welding in wet conditions)

✓ **Fire watch for one hour after welding & until all welds have cooled**
✓ **Perform final fire watch and terminate the permit.**

5.3.2 SOP: Gas Welding

Perform Safety Check on all equipment

- Ensure tanks have gas and fittings are tight
- Ensure fire extinguisher is charged and available
- Ensure hoses have no defects
- Ensure PPE (welding hood, gloves, rubber boots/soled shoes, aprons) are available and have no defects.
- All defective equipment must be repaired or replace before use.

Remove flammables and combustibles

- No welding is permitted on or near containers of flammable material, combustible material or unprotected flammable structures.

- Place welding screen or suitable barricade around work area to provide a fire safety zone and prevent injuries to passersby (Do not block emergency exits or restrict ventilation)

  - ✓ **Ensure Adequate Ventilation and Lighting**
  - ✓ **Execute Hot Work Permit procedures**
  - ✓ **Open Valves on Oxygen and Gas tanks to desired flow**
  - ✓ **Shut Tank Valves & relieve hose pressure. Store hoses**
  - ✓ **Fire watch for one hour after welding & until all welds have cooled**
  - ✓ **Perform final fire watch and terminate the permit.**

6.0 RECORDKEEPING

An accurate record of the medical surveillance required shall be retained. This record shall be retained for the period specified and meet the criteria of (§3204. Access to Employee Exposure and Medical Records).

The record required shall include at least the following information:

- All training records.
- The name and social security number of the employee.
- Physician's written opinions recommended limitations, and results of examinations and tests.
- Any employee medical complaints related to exposure to hazardous substances.
- A copy of the information provided to the examining physician by the employer, with the exception of the standard and its appendices.

7.0 REFERENCES

1.	**Documents & External References** file:///F:/USRAVs%20Working/2nd%20Set/New%20Set/103.%20Welding,%20Cutting,%20Hot%20Work/Research/hotworkprogram.pdf, https://www.ifc.org/wps/wcm/connect/6e4e348048865839b4cef66a6515bb18/1-6%2BWaste%2BManagement.pdf?MOD=AJPERES, *Reference: OSHA 29 CFR 1910.252.*

8.0 REVISION INFORMATION

This applies to changes made to the current version of the preceding document.

Section	Nature of Amendments

9.0 APPENDICES

None.