Earth Support Corp.

We hold the ground so you can build.

EARTH SUPPORT CORP. — WRITTEN SAFETY & HEALTH PROGRAM

We hold the ground so you can build.

Earth Support Corp. ("ESC")
56 Broad Street, Suite 32686, Boston, MA 02109

Document	Written Safety & Health Program
Revision	**1.0-G (public edition)**
Derived from	Earth Support Corp. Written Safety & Health Program, Revision 1.0 — ESC's controlled project submittal
Effective date	**July 14, 2026**
Next scheduled review	**July 14, 2027**
Approved by	**Derek Snow, Treasurer** — support@earthsupportcorp.com
Competent Person / Site Safety Supervisor	**Jean Prinsloo** — MA Construction Supervisor License **CS-122896** — support@earthsupportcorp.com
Jurisdiction	Federal OSHA, 29 CFR Part 1926 (Massachusetts operates no State Plan covering private-sector construction)
Recordkeeping status	10 or fewer employees at all times during 2023, 2024 and 2025 — partially exempt from routine OSHA recordkeeping per 29 CFR 1904.1. **The reporting duties of 29 CFR 1904.39 still apply in full.**
Safety record	**Zero OSHA-recordable injuries or illnesses in the past three years. Zero fatalities. No OSHA citations.**

THIS IS THE PUBLIC EDITION

This document is the corporate Safety & Health Program of Earth Support Corp., published in full so that a general contractor, an owner or a prequalification reviewer can read ESC's actual safety program without asking for it and without waiting for it. It is **Revision 1.0-G (public edition)**, derived from ESC's controlled **Revision 1.0** program. It is not a summary and it is not a brochure: the hazard programs, the written silica exposure control plan, the drilled-shaft operating rules, the emergency procedures, the training and discipline systems and the recordkeeping position are reproduced here in full.

What this edition does not carry, and how to get it:

1. **Completed site-specific cards and project appendices.** Wherever this program calls for a value that can only be true if a person walked the site — the crew assembly point, the emergency access route, the ambulance meeting point, the nearest emergency department, the Dig Safe ticket number, the utility's stated line voltage, the rig's rated capacities — **this edition shows the field and the duty, and states when and by whom it is completed.** No placeholder value has been invented. **ESC's designated Competent Person completes every one of them, on the project's own copy, before the first shift.** The structure is the control; the entry is the field evidence.
2. **The certificate of insurance.** ESC maintains **General Liability, Umbrella / Excess Liability, Contractors Errors and Omissions, and Workers' Compensation** coverage. A **current ACORD certificate of insurance, naming the requesting parties as additional insureds where the contract requires it, is issued with every prequalification submittal and before mobilization on every project.** The certificate — **not this manual** — is the controlling evidence of coverage. This program states no limit and no identifier by design: a figure printed in a manual is stale the day the policy renews, and the certificate is the document a reviewer is entitled to rely on. See Section 1.4.1(6).
3. **Counterparty and project data.** Named contacts, contract and job numbers, site addresses and site-security detail belong to the projects they came from, and are not published here.

To request the certificate of insurance, the Experience Modification Rate letter, a project-specific site safety plan, the twelve task-level Job Hazard Analyses, the training matrix, or ESC's internal incident register: support@earthsupportcorp.com.

This edition may be read, printed and circulated freely. It may not be presented as a project submittal — a project submittal is issued by ESC, dated, addressed and signed.

APPROVED AND ISSUED:

Signature: _____ Date: _____
Derek Snow, Treasurer, Earth Support Corp.

COMPETENT PERSON ACKNOWLEDGMENT:

Signature: _____ Date: _____
Jean Prinsloo, Site Safety Supervisor / Competent Person, MA CS-122896

How to Use This Manual

This is one document in five Parts. It is the controlled master. A current printed copy lives **in the site safety file on every ESC jobsite** and in every ESC vehicle, and it is available to every employee, to the general contractor, to the owner, and to any authorized representative of OSHA, on request and at no cost.

Read it this way:

- **Part 1 — Program Foundation & Administration.** Who is responsible, stop-work authority, training, discipline, subcontractors, meetings, incident reporting, recordkeeping. *Start here on day one.*
- **Part 2 — Health Hazards, PPE & Exposure Control.** Hazard communication, PPE, the **written respirable crystalline silica exposure control plan (29 CFR 1926.1153(g))**, respiratory protection, noise, heat, cold, vibration, contaminated soil.
- **Part 3 — Drilled Shaft & Foundation Drilling Operations.** The operational heart of the program: rig setup and stability, overhead power lines, underground utilities, the rotating auger, casing, rock coring, **open-shaft protection**, and ESC's absolute **NO-MAN-ENTRY** policy.
- **Part 4 — Lifting, Rigging, Concrete & General Construction Safety.** Cranes and the auxiliary winch, rigging, rebar and concrete, excavation and trenching, hand and power tools, electrical, ladders, work-zone and traffic control, fire and fueling.
- **Part 5 — Emergency Response, Incident Management & Program Assurance.** The Emergency Action Plan, first aid and AED, incident investigation, OSHA 1904.39 reporting, inspections and audits, JHAs, and revision control.

Three rules that override everything else in this manual:

1. **Anyone can stop the work.** Any ESC employee — and any worker of any other employer on the site — has unconditional stop-work authority and may give an emergency stop signal to any equipment operator. **No one is ever retaliated against for using it** (Part 1, Section 1.5).
2. **No person ever enters a drilled shaft.** No exceptions. No field waiver. Cleanout is by tooling only (Part 3, §3.10).
3. **No shaft is ever left open and unattended.** Cover it (secured and marked) and barricade it before you step away (Part 3, §3.9).

Conventions. This manual carries no open items and no notes-to-self. Every fact that Earth Support Corp. can state is stated here in full.

- **Ruled blank lines and empty table cells are field entries, not omissions.** A Dig Safe ticket number, a rig serial number, a crew member's name, this morning's readings, a signature and a date are recorded **in the field, on the day of the work, by the people actually present.** That is the only way they can be true.
- **Machine-specific limits are read off the machine, not out of this book.** Rated capacities, mast height and inclination limits, permissible ground-bearing pressure, winch line pull and wind limits are read from **that rig's operator's manual and load chart**, posted in the cab, and written onto the daily inspection form before the first setup. This manual tells you to go get the number; it does not pretend to know it.
- **Numbers only a third party can issue are not printed here.** ESC's insurance carrier, identifiers, effective dates and limits appear on the **ACORD certificate of insurance issued with every prequalification submittal**; the certificate, not this manual, is the controlling evidence of coverage. ESC's Experience Modification Rate letter is issued directly by ESC's insurance broker, on request, to any party that asks for it. ESC does not restate either figure from memory.
- **Pre-filling a signature, a crew name or a date on a safety record is falsification of a safety record and is a terminable offence (Part 1, Section 1.7.3).**

Scope Statement

Trade and scope of work. Earth Support Corp. self-performs **deep foundations and earth retention**: drilled-pier / caisson installation, soil-nail walls, shoring and support of excavation, underpinning, and slope stabilization, together with all associated site work, materials handling, concrete placement, spoil management and demobilization.

Who this program covers. All ESC employees, at all ESC work locations, at all times; all ESC-controlled work areas, including the ESC yard, ESC vehicles, and any exclusion zone or restricted access zone ESC establishes on a jobsite; and all subcontractors, lower-tier subcontractors, suppliers, equipment lessors with operators and independent contractors performing work under ESC's scope or inside an ESC-controlled work area.

Geography. ESC works in **Massachusetts, Rhode Island and Connecticut**, and also in New Hampshire, Vermont and Maine.

Governing law. Federal OSHA, 29 CFR Part 1926, applies in full to ESC's private-sector construction work in Massachusetts; Massachusetts operates no State Plan covering private-sector construction. ESC also complies with 29 CFR Part 1904 (reporting), with Massachusetts statutes that impose independent duties — notably **M.G.L. c. 82 §§ 40–40E** (Dig Safe) and **M.G.L. c. 166 §§ 21A–21G** (overhead high-voltage lines) — and, where more protective than the regulation, with **ANSI/ASSP A10.23, *Safety Requirements for the Installation of Drilled Shafts***, which ESC formally adopts.

Project-specific entries. This public edition carries no project data. On ESC's controlled copy for a given job, the project-specific fields throughout this manual — the general contractor and the engineers of record, the site address, the geotechnical report of record, the shaft schedule and the site conditions — are completed by the Competent Person from the contract documents and the preconstruction site walk **before the first shift**, and the completed copy is issued to the general contractor together with ESC's site-specific safety plan.

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EMERGENCY INFORMATION — READ BEFORE THE FIRST SHIFT

> **POST THIS PAGE AT THE SITE BOX AND CARRY IT IN EVERY ESC VEHICLE. This card is completed per project, before the first shift, by the Competent Person. It is never posted with blanks.** Project: _____ · Site address, said to the 911 dispatcher exactly as written: _____

CALL 911

911 for any injury beyond minor first aid, any fire, any electrical contact, any collapse, any person in a shaft, any gas leak, any unresponsive person, and any confusion or altered mental status in the heat.

> **KNOW BEFORE THE FIRST SHIFT WHERE THE RESPONDERS COME FROM AND HOW LONG THEY TAKE. WHERE THE SITE IS AT OR BESIDE AN OCCUPIED FACILITY THAT HAS ITS OWN EMERGENCY PERSONNEL, THAT IS RECORDED ON THIS CARD — AND 911 IS STILL THE CALL: 911 DISPATCHES THEM AND THE AMBULANCE AND CREATES THE RECORD. THEN SEND A RUNNER TO MEET THE RESPONDERS AND WALK THEM IN.**

Nearest Emergency Department

Identified for each project before the first shift — and the route is physically DRIVEN, not estimated, with the actual time written down.

Hospital / emergency department: _____
Address: _____ Phone: _____
Emergency Department open 24 hours? **Yes ☐ No ☐** Is it a verified trauma center? **Yes ☐ No ☐**
Distance: _____ miles Route driven by: _____ Actual drive time: _____ Date: _____

A community hospital is the right destination for a laceration, a sprain, an eye injury, heat illness or a simple fracture. A community hospital is NOT the destination for a crush, a degloving, an amputation or major blunt trauma — see the next section. Whether the nearest emergency department is a trauma center is established before the first shift, never on the day.

Crush, amputation, major trauma — where the patient actually goes

EMS decides the receiving hospital, not ESC. The crew's job is to call 911, say the words "crush injury," "amputation" or "major trauma" out loud to the dispatcher, control the bleeding, and preserve the amputated part. Saying the word is what selects the destination and the mode of transport.

Injury	Facility	Address	Phone
Major trauma / crush — Level 1 trauma center. *(The nearest verified Level 1 centre to the site is confirmed and written on the site card before the first shift; the facilities below are the standing regional references for ESC's operating area.)*	**Lahey Hospital & Medical Center** (ACS-verified Level 1)	41 Mall Road, Burlington, MA 01805	**(781) 744-5100**
Major trauma — Boston reference facility	**Massachusetts General Hospital** (ACS-verified Level 1 Adult)	55 Fruit Street, Boston, MA 02114	**ED (617) 724-4100**
Amputation / replantation	**MGH Hand & Arm Service** — the replantation referral center for New England	55 Fruit Street, Boston, MA 02114	**(617) 726-4700** — for an acute amputation the patient goes to the **MGH Emergency Department, (617) 724-4100**

Amputated part: wrap it in sterile gauze **moistened with saline**, seal it in a clean plastic bag, and put that bag **on ice or in ice water**. **Never put the part directly on ice. Never immerse it in water.** It travels with the patient.

Key numbers

Who	Number
Fire / Police / Ambulance	**911**
Emerson Hospital — Emergency Department (24 hrs)	**(978) 369-1400**
Poison Control	**1-800-222-1222**
Dig Safe — utility mark-out, required before ANY excavation. Massachusetts law (**M.G.L. c. 82 §40A; 220 CMR 99.04(1)**) requires notice **at least 72 HOURS — excluding Saturdays, Sundays and legal holidays** — and **not more than 30 days** before excavating. **Call Monday morning, dig Thursday morning at the earliest.**	**811** or **(888) 344-7233**
Federal OSHA — 24-hour reporting hotline. Fatality within **8 hours**; in-patient hospitalization, amputation or loss of an eye within **24 hours** (29 CFR 1904.39).	**1-800-321-OSHA / 1-800-321-6742**
OSHA Area Office with jurisdiction over this site — confirmed by the Treasurer before mobilization and written on this card	Office: _____ Phone: _____
ESC — Jean Prinsloo, Site Safety Supervisor / Competent Person (MA CS-122896)	Direct number, written on this card before the first shift: _____ · support@earthsupportcorp.com
ESC — Derek Snow, Treasurer (makes the OSHA 1904.39 report)	Direct number, written on this card before the first shift: _____ · support@earthsupportcorp.com
Lahey Hospital & Medical Center — nearest **Level 1 trauma center**, 41 Mall Road, Burlington, MA 01805	**(781) 744-5100**
Massachusetts General Hospital — Level 1 trauma; **Hand & Arm Service (replantation)**, 55 Fruit Street, Boston, MA 02114	**ED (617) 724-4100** — Hand & Arm **(617) 726-4700**

Who	Number
Local police — non-emergency, and the occupant's own line where the site sits at an occupied facility. **This is NOT a number for an emergency. For an emergency, call 911.**	_____
Local fire department — non-emergency / administration. For an emergency, call 911.	_____
General Contractor — site superintendent physically running the site	Name: _____ Cell: _____ *(entered on this card at the preconstruction meeting, before the first shift)*
Electric utility serving this site. Downed line, contacted line, arcing. **Call 911 FIRST, then the utility. Only the utility de-energizes.**	Utility: _____ 24-hr line: _____ *(In eastern Massachusetts this is commonly Eversource, 24-hr 1-800-592-2000 — confirm the owner/operator for each site.)*
Gas utility serving this site. Gas odor, struck service, hissing line. **Evacuate upwind, no ignition sources, then call 911 FIRST and the gas utility from a safe distance.**	Utility: _____ 24-hr line: _____ *(Across much of Massachusetts this is National Grid, 24-hr 1-800-233-5325 — confirm the owner/operator for each site.)*
Water department / district serving this site (24/7 on-call)	_____
MassDEP 24-hour Environmental Emergency (spill / release). **Any spill of oil, diesel or hydraulic fluid of 10 gallons or more — or any spill of any size reaching a wetland, surface water, storm drain or drinking-water resource area — is reportable within 2 hours** (310 CMR 40.0311). Call the local fire department first, then MassDEP.	**1-888-304-1133**
ESC Workers' Compensation — in force	The carrier, the identifiers and the carrier's claims-reporting line are printed on the **ACORD certificate of insurance**, a copy of which is carried in the site safety file and in each ESC vehicle, and on the Workers' Compensation notice posted at the site box. **Report every injury to Jean Prinsloo immediately; Derek Snow files the claim** through ESC's insurance broker.
ESC General Liability, Umbrella / Excess Liability and Contractors Errors and Omissions — in force	See the current certificate of insurance; it is the controlling evidence of coverage (Section 1.4.1(6)).

The five things that will kill someone on this job

1. **Contact with an overhead power line. If the rig contacts a line: THE OPERATOR STAYS IN THE CAB.** Everyone else stays away from the machine, the load and the ground around it. Only the utility de-energizes. If the operator must leave because of fire — **JUMP CLEAR, feet together, never touching the machine and the ground at once, then shuffle away with feet together.**
2. **A fall into an open shaft. Cover it (secured and marked) and barricade it before you step away. NOBODY ENTERS A SHAFT — NOT EVEN TO RESCUE.** Call 911 and request **technical rescue**.
3. **The rotating auger / kelly.** If it can turn, you cannot touch it. The auger is cleaned only with the rig **shut down**.
4. **Rig overturn.** Level machine, tracks extended, mats down, auxiliary winch within the manufacturer's chart. **The rig is not a crane.**
5. **A buried utility strike.** Nothing turns until Dig Safe has responded, private facilities are located, and **every pier location with a known or suspected conflict has been soft-dug.** On a gas strike: **evacuate upwind, no ignition sources, call 911 from a safe distance.**

Site conditions responders and crew must know

Completed for each project from the geotechnical report of record and the preconstruction site walk, before the first shift. These are field entries: they are true only if the person who read the report and walked the site wrote them.

- Shaft schedule — number of shafts, diameter, embedment: _____. **A shaft of the diameters ESC installs is too narrow for a rescuer in SCBA — that is why no one ever enters one, on any ESC project.**
- Top of rock, rock quality (RQD), and whether rock coring / socketing is required: _____
- Boulders and obstructions logged in the borings: _____
- Groundwater depth, and whether it falls within shaft depth (temporary casing likely): _____
- Known and suspected buried utility conflicts, and the pier locations that will be soft-dug before the auger turns: _____
- Protected exclusion areas (leach fields, stormwater basins, wetlands, drainage structures): _____
- Site character — occupied building, public traffic, emergency-vehicle traffic, pedestrian routes: _____
- Geotechnical report of record — firm, report number, date, number of borings: _____

Site-specific fields — set at the preconstruction site walk with the general contractor and the facility owner, written on this card, and marked on the posted site plan before the first shift.

Primary crew assembly point: _____ Alternate crew assembly point: _____

(The crew assembly point is the place the crew walks to on an alarm and is counted at. Both are set at the preconstruction meeting, marked on the posted site plan, and briefed at orientation. Neither may sit on an emergency access route, in front of an apparatus bay, or across a building exit.)

Ambulance / fire apparatus meeting point — **send a runner here and walk the responders in**: _____

Gate / lot entrance the responders will use: _____

Emergency access route that must stay clear at all times — ambulance and fire apparatus, and at an occupied facility the occupant's own emergency egress: _____

Dig Safe ticket no.: _____ Date called: _____ Ticket expires (30 days): _____

First aid kit location: _____ AED: _____ Eyewash: _____ Fire extinguishers: _____

Spill kit (absorbent boom, pads, granular absorbent, drum, shovel) location: _____

Trained First Aid / CPR / AED provider on shift (print name): _____

Prepared by: _____ Date: _____

Briefed to the crew by: _____ Date: _____

PART 1 — PROGRAM FOUNDATION & ADMINISTRATION

1.1 Safety & Health Policy Statement

Earth Support Corp. ("ESC") holds the ground so others can build. We drill caissons, install soil-nail walls, shore excavations, underpin structures and stabilize slopes. Every one of those operations is performed in and around energy that can kill a person in a second — a rotating kelly, a suspended casing, an open shaft, an energized conductor, an unsupported face. There is no version of this trade in which safety is a department. It is the work itself.

It is the policy of Earth Support Corp. that:

1. **No production goal, schedule commitment, cost target or client demand justifies exposing any person to an uncontrolled hazard.** If a task cannot be performed safely, ESC does not perform it until it can be.
2. **ESC will comply with all applicable federal, state and local safety and health requirements**, including the Occupational Safety and Health Act of 1970 (29 U.S.C. § 654), the OSHA construction standards at 29 CFR Part 1926, the OSHA recordkeeping and reporting rules at 29 CFR Part 1904, and applicable Massachusetts law. Where an industry consensus standard is more protective than the regulation — notably ANSI/ASSP A10.23, *Safety Requirements for the Installation of Drilled Shafts* — ESC follows the more protective requirement.
3. **ESC provides the resources** — the equipment, the engineering controls, the personal protective equipment, the training, the time and the manpower — needed to execute this program. Safety expenditures are not subject to field negotiation.
4. **Every ESC employee has unconditional stop-work authority** (Section 1.5 of this Part). No employee will ever be disciplined, dismissed, demoted, reassigned or otherwise retaliated against for stopping work, reporting a hazard, reporting an injury, or contacting OSHA.
5. **Every employee is accountable** for following this program, for using the controls ESC provides, and for looking out for the person working next to them.

This program is a living document. It will be reviewed at least annually, and immediately following any incident, near-miss, regulatory change, or change in ESC's methods or equipment.

I personally commit the company's resources to this program and expect every employee, every foreman and every subcontractor working under ESC to honor it.

Signed: *Signed original on file, and issued with each prequalification submittal.*

Derek Snow, Treasurer
Earth Support Corp.
56 Broad Street, Suite 32686, Boston, MA 02109
support@earthsupportcorp.com

Date: **July 14, 2026**

Program effective date: **July 14, 2026**
Revision: **1.0**
Last annual review: *Not applicable — this is the initial issue (Revision 1.0).*
Next annual review due: **July 14, 2027**

1.2 Purpose and Scope

1.2.1 Purpose

This written Safety & Health Program establishes ESC's methods for identifying, evaluating, controlling and eliminating occupational hazards; assigns responsibility for each element of the program; and documents ESC's compliance with 29 CFR Part 1926 and 29 CFR Part 1904. It satisfies, among others:

- **29 CFR 1926.20(b)(1)** — "It shall be the responsibility of the employer to initiate and maintain such programs as may be necessary to comply with this part."
- **29 CFR 1926.20(b)(2)** — "Such programs shall provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the employers."
- **29 CFR 1926.20(b)(3)** — the requirement that use of machinery, tools, materials or equipment which is not in compliance with any applicable requirement of Part 1926 is prohibited.
- **29 CFR 1926.20(b)(4)** — "The employer shall permit only those employees qualified by training or experience to operate equipment and machinery."
- **29 CFR 1926.21(b)(2)** — "The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury."

1.2.2 Scope

This program applies to:

- All ESC employees, at all ESC work locations, at all times.
- All work ESC self-performs: drilled-pier / caisson installation, soil-nail walls, shoring and support of excavation, underpinning, slope stabilization, and all associated site work, materials handling, concrete placement and demobilization.
- All ESC-controlled work areas, including the ESC yard, ESC vehicles, and any exclusion zone or restricted access zone ESC establishes on a jobsite.
- All subcontractors, lower-tier subcontractors, suppliers, equipment lessors with operators, and independent contractors performing work under ESC's scope or inside an ESC-controlled work area (Section 1.9).

Geographic scope. ESC performs work in Massachusetts, Rhode Island and Connecticut, and also in New Hampshire, Vermont and Maine.

1.2.3 Jurisdiction

Massachusetts has **no OSHA-approved State Plan covering private-sector employers.** The Massachusetts State Plan reaches state and local government workers only; federal OSHA exercises authority over private-sector employers in the Commonwealth. **Federal OSHA has jurisdiction over ESC's private-sector construction work in Massachusetts, and 29 CFR Part 1926 applies in full.**

Before ESC mobilizes into any state other than Massachusetts, the Treasurer confirms that state's OSHA jurisdiction — federal OSHA or an approved State Plan, and whether that State Plan covers private-sector construction — against OSHA's published State Plan list at osha.gov/stateplans, and records the determination in the project file. Where ESC works under an approved State Plan, ESC complies with the state standard wherever it is at least as effective as, or more stringent than, the federal standard.

Massachusetts state law also imposes independent duties that are **not** part of the OSHA scheme — most importantly **M.G.L. c. 166, §§ 21A–21G**, operation of equipment in close proximity to overhead high-voltage lines. These are enforced by criminal prosecution and by the utility's civil claim, not by OSHA, and ESC complies with them **in addition to** 29 CFR 1926. The operative rules:

Item	Massachusetts requirement	Citation
"In close proximity to overhead high voltage lines"	**within six (6) feet** of the line	M.G.L. c. 166, § 21A
"High voltage"	a voltage **in excess of 440 volts**, measured between conductors or between conductor and ground. **A 277/480 V service — exactly what a solar carport ties into — is "high voltage" under this statute.**	M.G.L. c. 166, § 21F
Prohibition	Operating or erecting any tool, machine or equipment capable of vertical, lateral or swinging motion within six feet of an overhead high-voltage line is **prohibited** unless the line is guarded by a mechanical barrier, or de-energized and grounded where necessary, or temporarily relocated by arrangement with the utility	M.G.L. c. 166, § 21B(1)–(2)
Boom/mast guard	An insulated **cage-type guard** or other approved protective device must be installed about the boom or arm of hoisting or other construction equipment operating in proximity to overhead high-voltage lines	M.G.L. c. 166, § 21B(3)
Utility notification	Before any operations within six feet, the person responsible for the work must **promptly notify** the utility, and the work may be performed **only after satisfactory arrangements have been negotiated** with the utility	M.G.L. c. 166, § 21E
Warning sign	A weather-resistant sign, **not less than 5 in. × 7 in.**, **yellow background with black lettering**, legible at twelve feet, reading **"WARNING—Unlawful to operate this equipment within SIX FEET of high voltage lines."** — posted **in plain view of the operator** and **on the outside of the equipment**. The statute names the **drilling rig** by name.	M.G.L. c. 166, §§ 21C, 21D, 21F
Penalty	Fine of **$100–$1,000**, imprisonment up to **one year**, or both	M.G.L. c. 166, § 21G(a)
Civil liability	A violation resulting in contact makes the violator **liable to the utility for all damage AND for all liability the utility itself incurs**	M.G.L. c. 166, § 21G(b)

How ESC reconciles the state and federal distances. The six-foot figure in the Massachusetts statute is a **floor, not a permission.** OSHA requires **twenty (20) feet** of clearance from a power line unless the line is de-energized and visibly grounded, or the line voltage has been obtained from the utility and the reduced Table A distance (ten feet for lines up to 50 kV) is held with the full set of encroachment-prevention measures (29 CFR 1926.1408(a)(2)). **Twenty feet is the greater distance, so twenty feet is ESC's operating limit unless and until the utility provides the line voltage in writing.** Fitting the Massachusetts cage-type guard does **not** allow ESC to work any closer — OSHA says so expressly at 29 CFR 1926.600(a)(6)(v). ESC complies with both bodies of law by taking the more stringent distance and by performing the state-law duties (utility notice, signs, guard) that OSHA does not impose.

1.2.4 Program Documents Incorporated by Reference

This program incorporates, and is to be read together with, ESC's:

- Respirable Crystalline Silica Written Exposure Control Plan (29 CFR 1926.1153(g))
- Overhead Power Line & Equipment Stability Program (29 CFR 1926.416, 1926.600(a)(6); ANSI/ASSP A10.23 §12)
- Open Shaft / Hole Protection and No-Entry Program (29 CFR 1926.501, 1926.502; ANSI/ASSP A10.23 §15)
- Excavation & Trenching Program (29 CFR 1926 Subpart P)
- Hazard Communication Program (29 CFR 1910.1200)
- Respiratory Protection Program (29 CFR 1910.134), when triggered
- Job Hazard Analyses (JHAs) and the project-specific Site-Specific Safety Plan required by ANSI/ASSP A10.23 §4.1 for each drilled-shaft project

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1.3 ESC Safety Philosophy

1.3.1 Hierarchy of Controls

ESC controls hazards in this order, and will not descend a level until the level above is exhausted:

1. **Elimination** — remove the hazard. *ESC's flagship example: ESC prohibits man-entry into drilled shafts entirely. Shaft cleanout is by tooling only. The highest-consequence hazard in caisson work is eliminated rather than managed.*
2. **Substitution** — use a less hazardous method, material or tool. *Example: a wet walk-behind saw instead of a handheld cut-off saw; a core barrel and wet flush instead of dry air-flush percussion drilling.*
3. **Engineering controls** — water at the bit, dust shrouds and HEPA collectors, casing, shoring, guardrails, covers, barricades, machine guarding.
4. **Administrative controls and work practices** — sequencing, exclusion zones, task-duration limits, signal persons, dedicated spotters, permits, JHAs, toolbox talks.
5. **Personal protective equipment** — the last line, never the first. PPE supplements engineering controls; it never substitutes for them.

1.3.2 Operating Principles

- **Plan the work, then work the plan.** Every drilled-shaft project gets a written site-specific safety plan and JHAs *before* mobilization, per ANSI/ASSP A10.23 §4.1.
- **A hazard that is seen and not corrected has been accepted.** Anyone who sees it owns it until it is fixed or reported.
- **Near-misses are treated as incidents.** A near-miss is a free lesson; ESC investigates it as if someone had been hurt.
- **Visible dust, an unprotected hole, an unbarricaded swing radius, or an unidentified overhead conductor are all stop-work conditions**, not discussion topics.
- **We are a small crew.** ESC has had **10 or fewer employees at all times during 2023, 2024 and 2025.** In a crew this size there is no anonymity and no bystander. Every person is expected to speak.

1.3.3 Safety Performance Record

ESC has had zero (0) OSHA-recordable injuries or illnesses in 2023, 2024 and 2025. ESC has never had a work-related fatality, in-patient hospitalization or amputation, and has never been issued an OSHA citation. ESC does not maintain an OSHA 300 Log, by reason of the small-employer partial exemption at 29 CFR 1904.1 (Section 1.12).

TRIR, DART and EMR. ESC does not publish a TRIR or DART rate. Those are rates, and a rate requires an hours-worked denominator that a partially exempt employer is not required to compile and that ESC does not publish; **the fact ESC states is the numerator, and it is zero.** ESC's **Experience Modification Rate is set by the rating bureau and stated by the carrier — not by ESC.** The EMR letter is issued directly, on request, by ESC's insurance broker. Any general contractor or owner who requires an EMR should ask ESC (support@earthsupportcorp.com) to have the broker issue the letter to them directly; ESC will not quote a number the broker has not certified. On request, ESC will also provide the carrier's loss runs, which show the same thing the letter does.

1.4 Roles and Responsibilities

1.4.1 Management — Derek Snow, Treasurer

Derek Snow, Treasurer, is the executive owner of this program and signs it on behalf of ESC. He is responsible for:

1. Establishing, approving, funding and enforcing this Safety & Health Program.
2. Providing the resources required for compliance — engineering controls, PPE, training, competent-person time, monitoring, medical evaluations and additional manpower (e.g., dedicated spotters, signal persons) — without requiring field-level justification.
3. Reviewing and updating this program at least annually, and after any incident, near-miss, or change in ESC's methods, equipment or regulatory obligations. Review date and reviewer are logged in Section 1.12.5.
4. Designating the Competent Person(s) in writing and granting them the authority required by the OSHA definition of "competent person."
5. Making OSHA notifications required by 29 CFR 1904.39 (Section 1.12.3), and serving as ESC's point of contact for any OSHA inspection.
6. Executing and maintaining ESC's insurance. **ESC maintains General Liability, Umbrella / Excess Liability, Contractors Errors and Omissions, and Workers' Compensation insurance.**
    - **A current ACORD certificate of insurance — naming the requesting parties as certificate holders and, where the contract requires it, as additional insureds — is issued with every prequalification submittal and again before mobilization on every project.**
    - **The certificate, not this manual, is the controlling evidence of coverage.** It carries the carrier, the effective dates, the identifiers and the limits actually in force on the day it is issued, and it is the only document any party should rely on for any of them. **This program deliberately states no limit and no identifier**: a figure printed in a manual is stale the day the policy renews, and a reviewer is entitled to the live document instead. Requests: **support@earthsupportcorp.com**.
    - A copy of the certificate is carried in the site safety file and in each ESC vehicle, so that the crew reads the Workers' Compensation claims-reporting details off the certificate rather than out of this book (Section 1.11.4).
    - ESC's **Experience Modification Rate letter is issued directly by ESC's insurance broker**, on request, to any general contractor or owner that asks for it (Sections 1.3.3 and 5.9.1).
7. Signing off on the disciplinary actions described in Section 1.7.
8. Reviewing incident investigations and approving corrective actions.

1.4.2 Site Safety Supervisor and Competent Person — Jean Prinsloo

Jean Prinsloo is designated in writing as ESC's Site Safety Supervisor and Competent Person. He holds Massachusetts Construction Supervisor License **CS-122896**, runs ESC's projects on site, and is reachable through support@earthsupportcorp.com. His direct number is written on the project's own Site-Specific Emergency Information Sheet and briefed to the crew before the first shift.

Definition and authority. OSHA defines a competent person (29 CFR 1926.32(f)) as "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." **ESC hereby grants Jean Prinsloo that authorization without qualification, including the authority to stop any ESC operation, to remove any person or piece of equipment from service, and to refuse to proceed, without prior approval from management and without any adverse consequence.**

He is designated as the Competent Person for, at minimum:

Program area	Standard
Excavations — soil classification, protective systems, daily inspections	29 CFR 1926.650(b), 1926.651(k), 1926.652
Respirable crystalline silica — frequent and regular inspections to implement the written exposure control plan	29 CFR 1926.1153(b), (g)(4)
Fall protection — hole covers, guardrails, PFAS inspection, training	29 CFR 1926.501, 1926.502, 1926.503
Drilled shafts — restricted access zone supervision, site-specific plan and JHA review with the crew	ANSI/ASSP A10.23 §4.2, §6.2, §6.3
Ladders and stairways	29 CFR 1926.1053(b)(15)
Rigging and slings	29 CFR 1926.251(a)(6)
Scaffolds, if used	29 CFR 1926.451(f)(3), 1926.454
Personal protective equipment hazard assessment	29 CFR 1926.95; 1926.28
Daily drill rig and mechanized-equipment inspection — pre-shift condition, mast, aux winch, guarding, leaks	29 CFR 1926.20(b)(2), (b)(3); 1926.601(b)(14); 1926.602(a)(2); ANSI/ASSP A10.23 §12.2
Hazard communication — chemical inventory, labels and SDS access on site	29 CFR 1910.1200(e)(1), (g)(8)
Housekeeping and spoils control at the shaft collar	29 CFR 1926.25; 1926.651(j)(2)

Any competent-person designation beyond those listed above is made in writing by the Treasurer, and the person's name is entered on the site-specific safety plan, before the work requiring it starts. No work requiring a Competent Person proceeds without a designated Competent Person physically on site.

Duties. Jean Prinsloo will:

1. Conduct and document **frequent and regular inspections of the jobsite, materials and equipment** as required by 29 CFR 1926.20(b)(2). ESC's standard is **at least once per shift, before work begins**, plus after any rainstorm, thaw, vibration event, or other hazard-increasing occurrence.
2. Perform the excavation inspections required by 29 CFR 1926.651(k)(1) — daily prior to the start of work and as needed throughout the shift.
3. Review the site-specific safety plan and all JHAs with every worker exposed to drilled-shaft hazards before work begins, per ANSI/ASSP A10.23 §4.2, and re-review whenever procedures change (§4.3).
4. Conduct the pre-task briefing at the start of each shift and lead weekly toolbox talks (Section 1.10).
5. Verify that the restricted access zone and swing-radius barricading are established, maintained and moved with the work (ANSI/ASSP A10.23 §6.2, §12.18).
6. Verify silica engineering controls each shift (water at the bit, nozzles clear, hoses intact, collector filters serviced, bags not overfilled, cab sealed, no visible dust) per 29 CFR 1926.1153(g)(4).
7. Verify open-hole protection before any crew member steps away from a shaft (covers secured and marked; barricades in place).
8. Verify the overhead-conductor survey, warning line and clearance before any equipment operates or travels.

9. Stop work whenever a hazard is not controlled.
10. Investigate every incident and near-miss and report to the Treasurer.
11. Maintain the site safety file: this program, the site-specific plan, JHAs, inspection records, toolbox-talk sign-in sheets, training records, SDSs, and a printed copy of the applicable standards.

If Jean Prinsloo is not on site, work requiring a Competent Person does not proceed until an alternate is physically present.

Designated alternate Competent Person: Derek Snow, Treasurer — support@earthsupportcorp.com. Derek Snow holds, without qualification, the same authority granted to Jean Prinsloo above, including the authority to stop any ESC operation and to remove any person or piece of equipment from service. He is also the person to whom stop-work escalations go. **ESC is a two-officer company: Derek Snow and Jean Prinsloo are the only persons who hold competent-person authority, and ESC will not paper over an absence by naming a third person who does not exist. If neither is on site, ESC does not drill.**

Written designation, signed at the start of each project and filed with the site-specific safety plan:

Project: _____ Site: _____

Competent Person on site: Jean Prinsloo (MA CS-122896) Designated (date): _____

Alternate Competent Person on site: Derek Snow Designated (date): _____

Designating officer's signature: _____ Date: _____

1.4.3 Foremen / Crew Leads

The foreman or crew lead in charge of a work area will:

1. Ensure no task starts until the JHA / pre-task plan for it has been reviewed with the crew that day.
2. Ensure required engineering controls and PPE are on site, functional and in use *before* the task starts — not after someone notices.
3. Enforce exclusion zones, barricades and the no-man-entry rule.
4. Correct unsafe acts and conditions immediately; stop work if they cannot.
5. Ensure every employee under their direction is trained and, where applicable, qualified and authorized for the equipment they operate (29 CFR 1926.20(b)(4)).
6. Report every injury, illness, near-miss, property-damage event and utility strike to the Competent Person and the Treasurer immediately.
7. Never assign a task to an employee who has not been trained on its hazards.

1.4.4 Employees

Every ESC employee must:

1. **Stop work and report any condition they believe to be unsafe** (Section 1.5). This is a duty, not merely a right.
2. Follow this program, all JHAs, all pre-task plans and all instructions from the Competent Person.
3. Wear and properly use the PPE ESC provides. Minimum site PPE for all ESC work: hard hat, ANSI-rated safety glasses, high-visibility apparel (Class 2 minimum in traffic areas), and sturdy work boots. Additional PPE per the JHA (gloves, hearing protection, face shield, fall protection, respirator).
4. Inspect their tools, equipment and PPE before each use and remove defective items from service.
5. Report **every injury or illness, however minor, and every near-miss, before leaving the site that day.** Late reporting compromises both the employee's care and ESC's ability to fix the cause.
6. Never operate equipment they are not authorized and qualified to operate.
7. Never enter a drilled shaft. **No exceptions. No field waiver. Ever.** (Section 1.3.1.)
8. Never bypass, disable or "improve" an engineering control or guard.
9. Report to work fit for duty and free from the influence of drugs or alcohol (Section 1.8).
10. Participate in orientation, task-specific training, toolbox talks and refresher training.

Employees are advised that they have a protected right under **Section 11(c) of the OSH Act (29 U.S.C. § 660(c))** to report hazards and injuries and to contact OSHA, and that ESC will not retaliate in any way for the exercise of that right.

1.4.5 Subcontractors and Lower-Tier Subcontractors

Any subcontractor engaged by ESC is responsible for the safety of its own employees, must comply with this program as a minimum, and must comply with Section 1.9 of this Part.

1.4.6 General Contractor / Controlling Employer Interface

ESC works as a **subcontractor** and is not the controlling employer. ESC will:

1. Submit this program and the project site-specific safety plan to the general contractor for review and approval before mobilization (ANSI/ASSP A10.23 §4.1 requires the plan be reviewed and approved by the project constructor).
2. Request the pre-construction safety meeting required by ANSI/ASSP A10.23 §6.1.3.
3. Require the GC/controlling entity, in writing, to (a) provide ground conditions and a working platform adequate for ESC's equipment per the manufacturer's specifications (29 CFR 1926.1402(c)(1); ANSI/ASSP A10.23 §6.1.2), and (b) disclose all known subsurface hazards — voids, tanks, utilities — beneath the equipment set-up area (29 CFR 1926.1402(c)(2); ANSI/ASSP A10.23 §6.1.1).
4. Promptly notify the GC in writing of any intrusion into ESC's restricted access zone by other trades or the public, and of any hazard created by another employer that affects ESC's employees (ANSI/ASSP A10.23 §6.2.3; 29 CFR 1926.1153(g)(1)(iv)).
5. Escalate unresolved multi-employer hazards to the GC's project manager and, if still unresolved, exercise stop-work authority.

Project counterparties — completed per project. ESC completes this table for each project from the contract documents and the pre-construction safety meeting, files it with the site-specific safety plan, and posts it at the rig.

Role	Party	Contact of record
General Contractor / project constructor	_____	_____
Developer / owner's representative	_____	Contact of record supplied by the GC at award
Engineer of Record	_____	Design questions and RFIs are routed **through the general contractor**; ESC does not contact the EOR directly
Geotechnical Engineer of Record (firm, report no., date, borings)	_____	Geotechnical questions are routed **through the general contractor**
Facility owner / occupant	_____	**Emergency: 911.** The occupant's non-emergency lines and the named daily contact are recorded at the pre-construction meeting and posted at the rig.

The named individuals for each counterparty are recorded at the pre-construction safety meeting, on the following block, and posted at the rig. ESC does not print a name it has not been given.

Pre-construction safety meeting held (date): _____ Location: _____

GC site superintendent: _____ Mobile: _____

GC project manager / safety contact: _____ Mobile: _____

Owner / developer representative: _____ Mobile: _____

Facility owner point of contact: _____ Phone: _____

ESC attendees: Jean Prinsloo (Competent Person) _____ Derek Snow (Treasurer) _____

1.5 Stop-Work Authority

1.5.1 The Authority

Every ESC employee — regardless of title, tenure, trade or employment status — has the unconditional authority and the affirmative duty to stop any work they reasonably believe to be unsafe. This authority extends to work being performed by ESC, by a subcontractor to ESC, or by any other party inside or adjacent to an ESC-controlled work area where it endangers an ESC employee.

No permission is required. No chain of command must be followed first. No justification is required in advance.

1.5.2 How to Stop Work

1. **Say "STOP."** Loudly. Or give the emergency stop signal. Per ANSI/ASSP A10.23 §12.15, **an emergency stop signal may be given to an equipment operator by ANY worker**, not only the designated signal person.
2. Make the area safe — secure equipment, back away, control the immediate hazard if it is safe to do so.
3. Notify the foreman and the Competent Person (Jean Prinsloo).
4. The Competent Person evaluates the condition and directs correction.
5. **Work does not resume until the Competent Person confirms the hazard is corrected or adequately controlled.** If the person who stopped the work is still not satisfied, the matter goes to the Treasurer (Derek Snow) before work resumes.
6. The Competent Person documents the stop-work event, the hazard, the correction and the restart approval on the daily inspection record.

1.5.3 No Retaliation

ESC will not discipline, terminate, demote, reassign, reduce the hours or pay of, or otherwise retaliate against any person for stopping work, raising a safety concern, reporting a hazard, reporting an injury or illness, refusing to perform an unsafe task, or contacting OSHA. This is an absolute rule with no exceptions.

An employee who stops work in good faith is protected **even if it turns out the condition was safe.** ESC would far rather absorb a hundred unnecessary stoppages than one funeral. Any employee who believes they have been retaliated against must report it directly to Derek Snow, Treasurer, or may contact OSHA directly (Boston Area Office, or 1-800-321-OSHA). Retaliation by any ESC supervisor is grounds for immediate termination under Section 1.7.

Failure to stop unsafe work is itself a disciplinary offense (Section 1.7.2).

1.6 Employee Safety Orientation and Training

1.6.1 New-Hire Orientation

No employee performs any work — including yard work — until they complete ESC's new-hire safety orientation, delivered by the Competent Person or the Treasurer and documented on a signed roster. Orientation covers, at minimum:

1. This Safety & Health Program and where to find it.
2. **Stop-work authority and the no-retaliation rule** (Section 1.5) — delivered explicitly and by name, on day one.
3. The identity, contact information and authority of the Competent Person (Jean Prinsloo).
4. ESC's **no-man-entry-into-shafts** policy.
5. Injury, illness and near-miss reporting: what to report, to whom, and when (same day).
6. Hazard Communication — the workplace chemicals ESC uses, SDS access, labeling, and the specific hazards of respirable crystalline silica: **cancer, lung effects, immune system effects and kidney effects** (29 CFR 1926.1153(i)(1)).
7. PPE — what is required, how to inspect, fit, use, maintain and dispose of it (29 CFR 1926.95, 1926.21(b)(2)).
8. Emergency action plan: emergency numbers, the crew assembly point, first-aid kit and eyewash locations, nearest hospital, and how to summon EMS to that specific site.
9. Site-specific hazards: overhead lines, buried utilities, traffic, open holes, silica, noise, heat/cold.
10. The disciplinary and accountability policy (Section 1.7) and the drug & alcohol policy (Section 1.8).

1.6.2 Task-Specific and Standard-Required Training

Per **29 CFR 1926.21(b)(2)**, ESC instructs each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to their work. ESC provides training, before assignment and at no cost to the employee, in at least the following:

Topic	Trigger / standard	Frequency
Hazard Communication (incl. silica health effects)	29 CFR 1910.1200(h); 1926.59	At assignment; on new hazard
Respirable crystalline silica — the six mandatory knowledge topics	29 CFR 1926.1153(i)(2)(i)(A)–(F)	At assignment; employee must be able to **demonstrate knowledge and understanding**
Excavation hazards, protective systems, access/egress	29 CFR 1926 Subpart P; 1926.21(b)(2)	At assignment
Fall protection — hazards, systems, hole covers, PFAS use and inspection	29 CFR 1926.503(a); certification of training per 1926.503(b)	At assignment; **retraining required per 1926.503(c)** on change of conditions/equipment or on inadequate retention
Overhead power lines — the seven mandatory training items, including **STAY IN THE CAB** on contact	29 CFR 1926.1408(g)(1); 1926.416(a)(3)	At assignment; before any work near lines
Dedicated spotter duties	29 CFR 1926.1408(g)(2); 1926.1430(g)	Before serving as spotter
Qualified signal person	ANSI/ASSP A10.23 §12.15; 29 CFR 1926.1428 (for cranes)	Before signaling
Rigging, slings, load handling	29 CFR 1926.251	At assignment
Drill rig operation — employer **qualification and written authorization**	ANSI/ASSP A10.23 §12.19; 29 CFR 1926.20(b)(4)	Before operating; re-evaluate on change of machine or task
Crane operation (if a crane is used) — **certification required**	29 CFR 1926.1427; ANSI/ASSP A10.23 §12.20	Certified operator only; 5-year cert cycle
Respiratory protection — medical evaluation, fit test, use, care	29 CFR 1910.134(c), (e), (f), (k)	Before any respirator use; **fit test annually**
Hearing conservation	29 CFR 1926.52, 1926.101	At assignment
Confined space awareness (ESC does not enter — awareness of why)	29 CFR 1926 Subpart AA (awareness only)	At assignment
Electrical safety / GFCI / assured grounding	29 CFR 1926.404(b)(1)	At assignment
Fire prevention and extinguisher use	29 CFR 1926.150	At assignment
Heat and cold illness prevention	29 CFR 1926.21(b)(2); OSH Act §5(a)(1)	Seasonally
First aid / CPR — at least one trained person on site where no infirmary/clinic/hospital is in near proximity	29 CFR 1926.50(c)	Certification current
Traffic control / flagger, where ESC works in or adjacent to traffic	29 CFR 1926.201; MUTCD Part 6	Before flagging
MUTCD / work zone in an active parking lot or roadway	29 CFR 1926.200–.203	Per project

Language. Training will be delivered in a language and vocabulary the employee understands.

1.6.3 Competent Person Development

ESC provides the Competent Person with training sufficient to satisfy the knowledge element of every competent-person designation he holds. This is the required curriculum, the provider ESC uses for each course, and the record ESC keeps. **Completion and expiry dates are entered on Form 1-A (Section 1.14) and on the line below each course — ESC does not print a training date it has not earned.**

Course	Provider ESC uses	Completed (date)	Expires
OSHA 30-Hour Construction	Keene State College OSHA Education Center — the authorized OSHA Training Institute Education Center for Region 1 (New England), 1050 Perimeter Road, Suite 202, Manchester, NH 03103 — 1-800-449-6742	_____	Does not expire; ESC refreshes on a 5-year cycle: _____

Course	Provider ESC uses	Completed (date)	Expires
Competent Person — Excavation & Trenching	Keene State College OSHA Education Center (Region 1 OTIEC)	_____	ESC standard: 3-year refresh — _____
Competent Person — Fall Protection	Keene State College OSHA Education Center (Region 1 OTIEC)	_____	ESC standard: 3-year refresh — _____
Respirable Crystalline Silica — Competent Person	Keene State College OSHA Education Center (Region 1 OTIEC)	_____	ESC standard: annual refresher — _____
First Aid / CPR / AED	American Red Cross — Massachusetts (redcross.org/local/massachusetts/take-a-class), or Health and Safety Services of Massachusetts, 781-941-0895 (on-site group class)	_____	**2 years from completion** — _____
Drilled-shaft safety / ANSI A10.23	ADSC — The International Association of Foundation Drilling (the association that negotiated the 1926.1400(c)(11) drill-rig exclusion and authored the ANSI/ASSP A10.23 guidance ESC follows)	_____	ESC standard: 3-year refresh — _____

OSHA does not mandate a specific training curriculum for a silica competent person (29 CFR 1926.1153); ESC is responsible for determining the training necessary, and the table above is ESC's determination. **The Competent Person's knowledge, ability and authorization — not a certificate — are what the standard requires; ESC documents all three.**

OSHA 10 / OSHA 30 — and the Massachusetts public-works mandate. Foremen and crew leads complete **OSHA 30-Hour Construction**; all field employees complete **OSHA 10-Hour Construction**. On this project that is not merely ESC policy — it is Massachusetts law. **M.G.L. c. 30, § 39S(a)(2)** requires, for any public-works or public-building contract estimated by the awarding authority to cost **more than $10,000**, that "*all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration* ***at the time the employee begins work***", and that the employer "*furnish documentation of successful completion of said course* ***with the first certified payroll report for each employee***." Under **§ 39S(b)**, any employee found on such a worksite without that documentation is **subject to immediate removal.**

This governs a large share of ESC's work: municipal and public-agency projects routinely exceed that threshold. **On any such project, every ESC employee who sets foot on the site holds a current OSHA 10 card or higher before the first day of work — there is no room for one untrained hand on a crew this size.** Each employee's course, completion date and DOL card number are recorded on **Form 1-A (Section 1.14)**, and the completion documentation is furnished with that employee's **first certified payroll report**. Because plastic DOL cards take weeks to arrive, ESC completes the training **before mobilization** and furnishes the course-completion certificate as interim proof.

1.6.4 Refresher Training and Retraining

ESC retrains an employee whenever:

- The employee's work, equipment, tools or site conditions change in a way that introduces a new hazard.
- An inspection, incident, near-miss or observation indicates the employee has not retained the required knowledge or is not following the required practice.
- A standard or an ESC procedure changes.
- Required by the standard (e.g., annual respirator fit testing per 29 CFR 1910.134(f)(2); fall protection retraining per 29 CFR 1926.503(c)).

ESC's baseline: annual refresher on silica, fall protection, excavation, overhead power lines and stop-work authority for every field employee, regardless of trigger.

1.6.5 Training Records

For each training event ESC records and retains: **employee name; training topic; date; duration; trainer name and qualifications; the method used to verify understanding (discussion, quiz, hands-on demonstration); and the employee's signature.** Fall protection training is certified in writing per 29 CFR 1926.503(b)(1) (name of employee, date of training, signature of the person who conducted the training or of the employer).

Training records are retained for **the duration of employment plus three (3) years**, and longer where a standard requires it. **Records are maintained at ESC's office — Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109 — and in ESC's electronic records system, both under the Treasurer's control.** A copy of every current, site-relevant record is kept in the site safety file at the rig. Employees may review their own training records on request, at no cost.

The master training matrix — employee × topic × completion date × expiry — is Form 1-A, printed at Section 1.14 of this Part. It is maintained by the Treasurer, reviewed by the Competent Person before every mobilization, and a current copy travels in the site safety file. **A worker whose row shows an expired or missing entry for a topic does not perform the task that topic covers.**

1.7 Accountability and Disciplinary Policy

1.7.1 Principle

Safety rules that are not enforced are not rules. ESC enforces this program consistently, from the Treasurer down. **Discipline is applied for unsafe acts and for failures of supervision — never for reporting a hazard, reporting an injury, or stopping work.**

Accountability also runs positive: adherence to this program is a factor in performance review, advancement and assignment of work.

1.7.2 Progressive Discipline

For most violations ESC applies progressive discipline:

Step	Action	Documentation
1	**Verbal warning** — hazard corrected on the spot, employee re-instructed on the correct procedure	Noted on the daily inspection record
2	**Written warning** — signed by the employee and the Competent Person; retraining assigned and completed before return to the task	Written Warning form, filed
3	**Suspension — one (1) to five (5) working days without pay**, the length set by the Treasurer according to the severity of the hazard, or removal from the task/site; retraining and demonstrated competence required before return	Disciplinary Action form, approved by the Treasurer
4	**Termination**	Approved by the Treasurer

Progression is not automatic. ESC considers the severity of the hazard, the employee's knowledge and training, whether the act was deliberate, and the employee's record. Steps may be repeated or skipped.

1.7.3 Immediate-Termination Offenses

The following will normally result in **immediate termination**, without progressive steps:

1. **Entering, or directing another person to enter, a drilled shaft.**
2. Removing, disabling, bypassing or defeating an engineering control, guard, cover, barricade or fall-protection system, exposing anyone to a fall or engulfment hazard.
3. Operating equipment within the prohibited clearance of an energized overhead conductor, or directing another to do so.
4. Reporting to work, or being at work, under the influence of alcohol or drugs (Section 1.8), or refusing a required test.
5. **Retaliating against, threatening or intimidating any person for stopping work or reporting a hazard, injury or illness** — applies to supervisors and non-supervisors alike.
6. Falsifying an inspection record, a training record, a test result, an incident report or any other safety document.
7. Willfully concealing an injury, an illness or a near-miss.
8. Fighting, horseplay or violence around operating equipment or an open excavation.

1.7.4 Supervisor Accountability

A foreman, crew lead or Competent Person who **knew of an unsafe condition or practice and permitted it to continue** is subject to discipline up to and including termination, on the same basis as the employee who performed the act. Supervisory tolerance of a violation is a violation.

1.8 Drug and Alcohol Policy

1.8.1 Policy

ESC is a **drug- and alcohol-free workplace**. The use, possession, sale, distribution or being under the influence of alcohol, illegal drugs, or the misuse of legal drugs, is **prohibited** on any ESC jobsite, in any ESC vehicle or equipment, in the ESC yard, and during working hours.

The reason is specific to this trade: an impaired person at the collar of an open shaft, under a suspended casing, or at the controls of a drill rig will kill someone.

1.8.2 Prescription and Over-the-Counter Medication

Employees taking any prescription or over-the-counter medication that may impair alertness, judgment, coordination or reaction time **must notify their foreman before starting work.** ESC will not disclose the medication or the medical condition; ESC will determine only whether the employee can safely perform the assigned task, and will reassign the employee if necessary. Employees will not be disciplined for a good-faith disclosure.

Marijuana: although recreational and medical marijuana use is lawful for adults in Massachusetts, **ESC prohibits marijuana use and impairment on the job and in safety-sensitive work.** Massachusetts law does not require an employer to permit on-site use or to tolerate impairment in safety-sensitive positions. All ESC field roles are safety-sensitive.

1.8.3 Testing

ESC tests in five circumstances, and in five only. ESC does not conduct random testing. Every test ESC conducts rests on an individualized, documented basis, and every test is conducted lawfully, by a licensed collection site, with the result reviewed before any action is taken.

1. **Pre-employment — yes.** Every candidate for a field position receives a conditional offer of employment and is tested before the first day of work. A candidate who refuses the test does not start. All ESC field roles are safety-sensitive.
2. **Reasonable suspicion — yes.** Testing is based on specific, articulable, contemporaneous observations of appearance, behavior, speech, odor, coordination or performance. **The observations are made and documented in writing, before the test is requested, by the Site Superintendent / Competent Person (Jean Prinsloo) or the Treasurer (Derek Snow); where both are on site, both record their observations independently.** ESC is a two-officer company and does not pretend to a two-supervisor panel it does not have — but a reasonable-suspicion test never rests on an undocumented hunch. The employee is removed from safety-sensitive work immediately and **will not drive themselves**; ESC arranges transport.
3. **Post-incident — yes, and applied by judgment, not by reflex.** Testing follows any injury requiring medical treatment beyond first aid, any equipment or property damage, any utility strike, or any near-miss with serious potential — **where the characteristics of the incident are such that drug or alcohol use could reasonably have contributed to it.** Under **29 CFR 1904.35(b)(1)(iv)** ESC may not discourage an employee from reporting a work-related injury or illness. **ESC will not test where impairment could not reasonably have played a part** (for example, a bee sting, or an injury caused by another employer's falling object), because a blanket post-incident test is exactly the kind of procedure that deters reporting. Post-incident testing is never used, and never referred to, as a consequence of reporting.
4. **Return-to-duty and follow-up — yes**, under a written last-chance agreement (Section 1.8.4).
5. **Client-required testing — yes.** Where a general contractor or owner requires participation in a substance-abuse program as a condition of site access, ESC complies and informs its employees in advance, in writing.

Random testing — no. ESC does not conduct random, suspicionless testing of its employees. **Massachusetts privacy law sharply limits an employer's ability to test an employee at random**, and a Massachusetts employer may not simply assert a general safety interest and test the workforce at will. ESC does not attempt it, does not need it, and does not claim it. The five grounds above are individualized and documented, which is both lawful and, in a crew this size, more effective: on a two-week caisson job the Competent Person is standing next to every worker, every shift.

Collection and analysis are performed by a licensed occupational health provider — ESC uses **OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — office (877) 399-1698, clinic (781) 664-2842** — which provides drug and alcohol testing services. Chain of custody is maintained on every specimen.

Refusal to submit to a required test, or tampering with a specimen, is treated as a positive result and is an immediate-termination offense (Section 1.7.3).

1.8.4 Assistance

ESC is a two-person company and does not operate an in-house Employee Assistance Program. It says so plainly rather than naming a program it does not have. An employee who voluntarily discloses a substance-abuse problem **before** an incident or a test request is referred, confidentially, by the Treasurer, to a licensed treatment provider. The referral is routed through ESC's occupational health provider — **OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — (877) 399-1698** — who arranges the clinical intake. The employee may also self-refer at any time, and ESC will not ask who the provider is.

At ESC's discretion the employee may be placed on leave and returned to work upon successful completion of treatment and a negative return-to-duty test, under a written last-chance agreement. **Voluntary disclosure is encouraged and will not, by itself, result in discipline.** A disclosure made *after* a test has been requested is not a voluntary disclosure.

Massachusetts and federal privacy law govern all test results. Results are maintained confidentially, kept **separate from personnel files**, and disclosed only to those with a genuine need to know. ESC does not disclose an employee's test result, medication or medical condition to a general contractor or owner; where a client requires confirmation of program participation, ESC confirms participation and nothing more.

1.9 Subcontractor and Lower-Tier Safety Management

ESC self-performs its work. When ESC does engage a subcontractor, supplier, trucking firm, equipment lessor with an operator, or any lower-tier entity that will have personnel in an ESC-controlled work area, the following applies.

1.9.1 Pre-Award Qualification

Before award, the prospective subcontractor must submit:

1. Its written safety and health program.
2. Certificates of insurance (General Liability, Auto, Workers' Compensation, Umbrella) naming ESC and the upstream parties as additional insureds as required by contract.
3. Its OSHA 300 Logs and 300A Summaries for the past three years **or** a written statement of its recordkeeping-exemption status.
4. Its EMR for the past three years, and its TRIR and DART rates.
5. Its OSHA citation history for the past three years.
6. Competent Person designations and supporting training records for the work it will perform.
7. Operator qualifications/certifications for any equipment it will operate.
8. Its written programs for any hazard it will create (silica, fall protection, respiratory protection, LOTO, etc.).

ESC will not award work to a subcontractor that cannot produce these.

1.9.2 Flow-Down Requirements

Every ESC subcontract will require the subcontractor to:

1. Comply with this ESC Safety & Health Program **as a minimum**, and with all applicable OSHA standards, state law, and the GC's project safety requirements.
2. **Flow these same requirements down to every lower tier**, verbatim.
3. Designate its own Competent Person(s) in writing, on site, for the work it performs.
4. Attend ESC's pre-task briefings and toolbox talks, and submit a JHA for each task before starting it.
5. **Grant its employees the same unconditional stop-work authority described in Section 1.5**, including the same no-retaliation protection.
6. Honor ESC's no-man-entry-into-shafts policy without exception.
7. Report every injury, illness, near-miss, utility strike and property-damage event **to ESC immediately**, and provide ESC with a copy of any OSHA 300 entry, 1904.39 report, citation or inspection notice arising from work on an ESC project.
8. Comply with ESC's exclusion zones, barricades and restricted access zones, and control its own dust, noise and debris so as not to expose ESC's employees (see 29 CFR 1926.1153(g)(1)(iv), which requires ESC's silica plan to address exposures generated by other employers).
9. Correct any hazard ESC identifies, immediately, at its own cost.
10. Remove from the project any person ESC determines to be creating or accepting an unsafe condition.

1.9.3 Ongoing Oversight and Multi-Employer Doctrine

ESC's Competent Person will include subcontractor work in his daily inspections. **ESC's stop-work authority extends to subcontractor work.**

ESC understands OSHA's multi-employer citation policy (CPL 02-00-124) and that ESC may be cited as a **creating**, **exposing**, **correcting** or **controlling** employer. Accordingly:

- ESC will not create a hazard that exposes another employer's employees (open holes, dust, swing radius, spoil).
- Where ESC's employees are exposed to a hazard created by another employer, ESC will (a) remove its employees from exposure, (b) ask the creating employer to correct it, and (c) notify the GC in writing. If the hazard is not corrected, ESC will not work in the area.

- Where ESC is responsible for correcting a hazard, ESC will correct it.

1.9.4 Non-Compliance

Subcontractor non-compliance is handled by: (1) immediate correction; (2) written notice of non-compliance; (3) removal of the offending individual; (4) suspension of the subcontract with all costs of delay borne by the subcontractor; (5) termination for cause.

1.10 Safety Meetings, Toolbox Talks and Pre-Task Planning

Meeting	Frequency	Led by	Attendance	Documentation
Pre-construction / pre-mobilization safety meeting with the GC	Once per project, before mobilization	Treasurer + Competent Person	ESC, GC, owner rep as applicable	Meeting minutes; approved site-specific safety plan (ANSI/ASSP A10.23 §4.1, §6.1.3)
Site-specific safety plan and JHA review with the crew	Before drilled-shaft work begins, and whenever procedures change	Competent Person	All exposed workers (ANSI/ASSP A10.23 §4.2, §4.3)	Signed sign-in sheet; plan and JHAs kept on site until work is complete
Daily pre-task briefing ("tailgate")	**Every shift, before work begins**	Foreman / Competent Person	Entire crew + any subcontractor working in the area	Pre-Task Plan form with crew signatures
Weekly toolbox talk	**Weekly, minimum**	Competent Person	All field employees + subcontractors on site	Toolbox Talk record: date, topic, presenter, signed attendance
Post-incident / post-near-miss stand-down	Immediately after any incident or near-miss	Competent Person	All affected personnel	Incident investigation record; corrective actions and who owns them
Annual program review	Annually	Treasurer	Management + Competent Person	Signed review log (Section 1.12.5)
Special-condition briefing	Whenever conditions change materially — new pier location, overhead conductor, utility strike, weather event, new equipment, new subcontractor on site	Competent Person	All affected personnel	Noted on the daily inspection record

1.10.1 Daily Pre-Task Briefing — Minimum Agenda

1. What we are doing today, pier by pier / task by task.
2. What can hurt us — the specific hazards of today's tasks (the JHA).
3. The controls: engineering controls in place, PPE required, exclusion zones, who is spotting, who is signaling.
4. **Overhead conductors and buried utilities** — located, marked, cleared? Warning line up?
5. **Open shafts** — which are open, who covers them, what the end-of-shift plan is.
6. **Silica** — which tasks, which controls, whose task-duration clock is running (29 CFR 1926.1153(c)(3)).
7. Emergency plan: nearest hospital, the crew assembly point, who calls 911, site address to give the dispatcher.
8. **Stop-work authority — restated. Anyone can stop this job. Any worker can give the emergency stop signal.**
9. Questions, and anything anyone saw yesterday that concerned them.

1.10.2 Toolbox Talk Topics

ESC maintains a rolling toolbox-talk schedule covering, at minimum: silica; fall protection and open holes; overhead power lines and electrical contact (stay in the cab); buried utilities and soft-dig; excavation and cave-in; rigging and suspended loads; drill rig stability, auxiliary winch limits and the fact that the rig is not a crane; swing radius and crush hazards; struck-by and traffic; housekeeping and slips/trips; hand and power tools; noise; heat and cold; PPE; incident and near-miss reporting; and **stop-work authority** (repeated at least quarterly).

1.11 Incident, Injury, Illness and Near-Miss Reporting

1.11.1 Employee Duty

Every injury, illness, near-miss, property-damage event, utility strike and equipment-contact event must be reported to the foreman and the Competent Person immediately — before the employee leaves the site that day. No injury is too minor to report. ESC's reporting procedure is reasonable and will not deter reporting, as required by **29 CFR 1904.35(b)(1)(i)–(iv)**; **ESC will not retaliate against any employee for reporting** (29 CFR 1904.36; Section 11(c) of the OSH Act).

1.11.2 Immediate Response

1. Ensure the scene is safe; do not create a second casualty.
2. Render first aid; call **911** for anything beyond minor first aid. Give the dispatcher the exact site address.
3. Notify the Competent Person (Jean Prinsloo) and the Treasurer (Derek Snow) immediately — their direct numbers are on the Site-Specific Emergency Information Sheet posted at the site box.
4. Preserve the scene and the equipment for investigation, unless doing so creates further hazard.
5. Notify the general contractor.

1.11.3 Investigation

The Competent Person will investigate every incident and near-miss, determine the root cause (not merely the immediate cause, and not "employee error" as a stopping point), identify corrective actions with named owners and due dates, and report to the Treasurer. Corrective actions are tracked to closure. Findings are communicated to the crew in a stand-down.

1.11.4 Medical Provider

Emergency services: 911.

Nearest emergency department — identified for each project before the first shift and written on the Site-Specific Emergency Information Sheet (Appendix 5-A):
Hospital: _____ Address: _____ Phone: _____ Emergency Department open 24 hours? **Yes ☐ No ☐ The route is physically driven and the actual time recorded before the first shift: Route driven by:** _____ **Actual drive time:** _____ **Date:** _____

Where the site sits at or beside an occupied facility with its own emergency personnel, that is recorded on the sheet and stated at every briefing — but the call is still 911. 911 dispatches the responders and the ambulance and creates the record.

Major trauma — crush, amputation, degloving, major blunt trauma. Emerson is a community hospital and is **not** a Level I trauma center. EMS makes the destination decision, but the crew must give the dispatcher the right words — **say "crush injury," "amputation," or "trauma"** — so that the right destination and the right mode of transport are chosen. The nearest **Level I trauma center** is **Lahey Hospital & Medical Center, 41 Mall Road, Burlington, MA 01805 — (781) 744-5100.** The definitive replantation referral center for New England is the **Massachusetts General Hospital Hand & Arm Service, 55 Fruit Street, Boston, MA 02114 — MGH Emergency Department (617) 724-4100.**

Occupational injury clinic (non-emergency care, and ESC's PLHCP for respirator medical evaluation, fit testing, audiograms and silica surveillance):
OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — office (877) 399-1698, clinic (781) 664-2842 — info@occumedne.com. Hours Mon–Fri 8:00 am–5:00 pm. **This is a clinic, not an emergency room. Anything beyond minor first aid goes to 911 or to Emerson, not to Canton.**

Poison Control: 1-800-222-1222.

Workers' Compensation: in force. The carrier, the identifiers and the carrier's claims-reporting number are printed on the ACORD certificate of insurance, and the certificate is carried in the site safety file and in each ESC vehicle — the crew reads them off the certificate, not off this page, because the certificate is the document that is current. **Every injury is reported by the Treasurer to the carrier the same day**, through ESC's insurance broker.

1.12 Recordkeeping and Reporting (29 CFR Part 1904)

1.12.1 ESC's Small-Employer Partial Exemption — Stated Plainly

Earth Support Corp. had 10 or fewer employees at all times during calendar years 2023, 2024 and 2025.

29 CFR 1904.1(a)(1) provides: *"If your company had ten (10) or fewer employees at all times during the last calendar year, you do not need to keep OSHA injury and illness records unless OSHA or the BLS informs you in writing that you must keep records under § 1904.41 or § 1904.42."*

Accordingly, ESC is partially exempt from the routine recordkeeping requirements of 29 CFR Part 1904 and is not required to maintain the **OSHA Form 300** (Log of Work-Related Injuries and Illnesses), the **OSHA Form 301** (Injury and Illness Incident Report), or the **OSHA Form 300A** (Summary), or to post the 300A annually.

Three points ESC states affirmatively, because they are the points that are commonly misunderstood:

1. **The exemption is size-based and applies regardless of industry** (29 CFR 1904.1). It is a separate exemption from the industry-based partial exemption at 29 CFR 1904.2 and Appendix A to Subpart B. ESC relies on the **size-based** exemption. Construction (NAICS 23) is **not** in the industry-exempt list, so a construction employer with more than 10 employees would be required to keep the 300 Log.
2. **The exemption is a "partial" exemption. It exempts ESC from routine recordkeeping only.** It does **not** exempt ESC from:
   - the fatality/hospitalization reporting duties of **29 CFR 1904.39** (Section 1.12.3 below), which apply to **all** employers, including partially exempt ones;
   - **29 CFR 1904.41 / 1904.42** — the duty to keep and submit records if OSHA or the BLS informs ESC in writing that it must;
   - the anti-retaliation and reasonable-reporting-procedure requirements of **29 CFR 1904.35** and **1904.36**;
   - **any substantive OSHA standard whatsoever.** ESC's compliance obligations under 29 CFR Part 1926 — including the silica standard's exposure records and 30-year retention at 29 CFR 1926.1153(j) and 29 CFR 1910.1020, medical records, training certifications, competent-person inspections, and the written programs required by individual standards — are **completely unaffected by the 1904.1 exemption.** A small employer owes exactly the same substantive safety compliance as a large one.
3. **If ESC's employee count exceeds 10 at any time in a calendar year, ESC must begin keeping the OSHA 300 Log for the FOLLOWING calendar year.** ESC's employee count is reviewed annually by the Treasurer as part of the program review (Section 1.12.5), and the determination is entered on the log below and signed. **ESC does not wait to be asked; the determination is made every January for the year just closed.**

Annual headcount determination log — 29 CFR 1904.1(a)(1)

Calendar year	Peak employee count at any time in the year	Determination under 1904.1	Determined by	Date	Signature
2023	**10 or fewer**	Partially exempt — no 300 Log required for 2024	Derek Snow, Treasurer		
2024	**10 or fewer**	Partially exempt — no 300 Log required for 2025	Derek Snow, Treasurer		
2025	**10 or fewer**	Partially exempt — no 300 Log required for 2026	Derek Snow, Treasurer		
2026			Derek Snow, Treasurer		

Incident history: ESC has had **zero (0) OSHA-recordable injuries or illnesses in 2023, 2024 and 2025** — and no fatality, in-patient hospitalization or amputation in the company's history. ESC does not report a TRIR, DART or EMR figure it has not verified; the recordable count is zero and that is the fact ESC states. Where a GC's prequalification form demands a rate, ESC states the 1904.1 exemption, states the zero-incident history, refers the requester to the broker for the EMR letter (Section 1.3.3), and provides the carrier's loss runs on request. **A blank where a 300 Log would go is not a gap in ESC's record. It is the lawful consequence of 29 CFR 1904.1, and this section is the certification of that fact.**

1.12.2 Records ESC Keeps Voluntarily

Notwithstanding the exemption, ESC **voluntarily** maintains an internal injury, illness and near-miss log so that:

- ESC can produce a defensible safety record for GC prequalification and bidding;
- ESC can identify trends and correct causes;
- ESC can immediately begin compliant recordkeeping if the exemption ever ceases to apply.

The internal log records: date, employee, task, description, body part, treatment, whether it would have been OSHA-recordable had ESC been required to keep a 300 Log, root cause and corrective action. **The internal log does not create an OSHA recordkeeping obligation and is not an OSHA Form 300.** Access to it is restricted; employee medical information is kept confidential and separate from personnel files.

1.12.3 Reporting Duties That Still Apply — 29 CFR 1904.39

These apply to ESC in full, notwithstanding the 1904.1 partial exemption. 29 CFR 1904.39(a)(1)–(2) and (b)(2) are explicit that partially exempt employers must still report.

Event	Deadline	Cite
Work-related fatality	Report **within 8 hours** of learning of it	29 CFR 1904.39(a)(1)
In-patient hospitalization of one or more employees	Report **within 24 hours** of learning of it	29 CFR 1904.39(a)(2)
Amputation	Report **within 24 hours** of learning of it	29 CFR 1904.39(a)(2)
Loss of an eye	Report **within 24 hours** of learning of it	29 CFR 1904.39(a)(2)

Reporting notes:

- A fatality must be reported only if it occurs **within 30 days** of the work-related incident (29 CFR 1904.39(b)(6)). An in-patient hospitalization, amputation or loss of an eye must be reported only if it occurs **within 24 hours** of the work-related incident (29 CFR 1904.39(b)(6)).
- **"In-patient hospitalization" means formal admission to the in-patient service of a hospital or clinic for care or treatment.** Treatment in an emergency room without admission is **not** reportable (29 CFR 1904.39(b)(9)–(10)).
- ESC does **not** report a fatality or hospitalization caused by a **motor vehicle accident on a public street or highway** (unless in a construction work zone), or one occurring on a commercial or public transportation system (29 CFR 1904.39(b)(3)–(4)). ESC **does** report a heart attack that OSHA's area office directs be reported (29 CFR 1904.39(b)(5)).
- **How to report** (29 CFR 1904.39(a)(3)): by telephone to the nearest OSHA Area Office during business hours; by telephone to the **OSHA 24-hour hotline at 1-800-321-OSHA (1-800-321-6742)**; or by electronic submission using the reporting application on OSHA's public website at www.osha.gov.
- **Information ESC must give OSHA** (29 CFR 1904.39(b)(2)): the establishment name; the location of the work-related incident; the time of the incident; the type of reportable event (fatality, in-patient hospitalization, amputation, or loss of an eye); the number of employees who suffered the event; the names of the employees who suffered the event; ESC's contact person and their phone number; and a brief description of the work-related incident.
- If ESC does not learn of a reportable event at the time it happens, the reporting clock runs **from the time ESC learns of it** (29 CFR 1904.39(b)(7)–(8)).

Responsible person for 1904.39 reporting: Derek Snow, Treasurer. Alternate: Jean Prinsloo, Competent Person. Both carry the reporting numbers and this obligation, and both direct numbers are on the Site-Specific Emergency Information Sheet posted at the site box.

OSHA 24-hour reporting hotline: 1-800-321-OSHA (1-800-321-6742).

OSHA Area Office with jurisdiction: the Area Office is county-specific, and **for every project the Treasurer confirms the Area Office covering that county before mobilization**, records it in the project file, and writes it on the Site-Specific Emergency Information Sheet. ESC does not assume the office that covered the last job covers this one. The **national 24-hour reporting hotline, 1-800-321-OSHA (1-800-321-6742), is always available** and is the fallback where the Area Office cannot be reached inside the reporting clock.

A separate Massachusetts clock — do not confuse it with 1904.39. Massachusetts workers' compensation law imposes its own, unrelated reporting duty. The **Employer's First Report of Injury or Fatality (DIA Form 101)** must be filed with the **Massachusetts Department of Industrial Accidents** when an employee is disabled for **five (5) or more full or partial calendar days** — *the days need not be consecutive* — and it must be filed **within seven (7) calendar days, excluding Sundays and legal holidays, after the injured worker's fifth day of disability.** Filing is **electronic only**; the DIA has not accepted a paper Form 101 since January 1, 2014. An injury causing fewer than five days of disability is handled as a medical-only claim reported to the workers' compensation insurer, not to the DIA.

These are three different duties with three different triggers, and ESC treats them separately: the OSHA **1904.39 reporting** duty (8 hours / 24 hours, driven by the *severity* of the event); the OSHA **1904 recordkeeping** duty (from which ESC is partially exempt); and the DIA **Form 101** duty (5 days / 7 days, driven by *lost time*). **An amputation with zero lost days is OSHA-reportable within 24 hours and is NOT DIA Form 101-reportable. A back strain with six lost days is DIA-reportable and is not OSHA-reportable at all.** Both duties belong to the Treasurer.

1.12.4 Other Records ESC Must Keep (Not Affected by the 1904.1 Exemption)

Record	Cite	Retention
Written exposure control plan — silica	29 CFR 1926.1153(g)(1); (g)(3) requires it be readily available for examination and copying by employees, their reps, the Assistant Secretary and the Director	Current; reviewed annually per (g)(2)
Silica **air monitoring** records — 7 required content items	29 CFR 1926.1153(j)(1); 29 CFR 1910.1020	**30 years**
Silica **objective data** records — 5 required content items	29 CFR 1926.1153(j)(2); 29 CFR 1910.1020	**30 years**
Silica **medical surveillance** records (name; PLHCP/specialist written opinions; information provided to the PLHCP)	29 CFR 1926.1153(j)(3); 29 CFR 1910.1020	**Duration of employment + 30 years**
Fall protection training certification	29 CFR 1926.503(b)	Current; ESC retains employment + 3 years
Competent-person inspections (excavation, silica, daily rig)	29 CFR 1926.20(b)(2); 1926.651(k); 1926.1153(g)(4); ANSI/ASSP A10.23 §12.2	ESC standard: **3 years** minimum
Employee exposure and medical records generally	29 CFR 1910.1020(d)	Exposure: 30 years. Medical: employment + 30 years
Respirator medical evaluations and fit-test records	29 CFR 1910.134(m)	Fit test: until the next fit test. Medical: per 1910.1020
Hazard Communication program and SDSs	29 CFR 1910.1200(e), (g)	Current; SDS access maintained
Training records (all topics)	29 CFR 1926.21(b)(2)	Employment + 3 years (ESC standard)
Toolbox talk / pre-task briefing sign-in sheets	ESC policy	3 years
Incident and near-miss investigations	ESC policy	5 years

ESC does not collect Social Security numbers for silica medical records. The current regulatory text at 29 CFR 1926.1153(j)(3)(ii)(A) requires only the employee's **name**. (OSHA's 2017 Small Entity Compliance Guide still references an SSN; the CFR text controls.)

1.12.5 Program Review Log

Review date	Reviewed by	Changes made	Signature
July 14, 2026	Derek Snow, Treasurer	Initial issue — Revision 1.0	

Next scheduled review: ***July 14, 2027****.* The Treasurer also reviews this program immediately after any incident, near-miss, regulatory change, or change in ESC's methods or equipment, and records the review on this log.

1.12.6 Availability

This program is maintained at ESC's office — Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109 — and in ESC's electronic records system, both under the Treasurer's control. A current printed copy is kept **in the site safety file on every ESC jobsite**, at the rig, for the duration of the work. It is available for examination and copying, on request and at no cost, to every ESC employee, their designated representatives, the general contractor, the owner, and any authorized representative of OSHA. A copy of any OSHA standard covering an employee's work — including 29 CFR 1926.1153 — will be provided to that employee at no cost on request (29 CFR 1926.1153(i)(2)(ii)).

Requests for this program, for ESC's insurance certificates, or for the 1904.1 certification letter go to: Derek Snow, Treasurer — support@earthsupportcorp.com.

1.13 Acknowledgment

I have received, read (or had read and explained to me), and understand Earth Support Corp.'s Safety & Health Program. I understand my responsibilities under it. **I understand that I have unconditional stop-work authority and that I will never be retaliated against for using it, for reporting a hazard, or for reporting an injury.** I understand that I must never enter a drilled shaft. I understand that violations of this program may result in discipline up to and including termination.

Employee name (print): _____

Employee signature: _____ Date: _____

ESC representative: _____ Date: _____

1.14 Form 1-A — Master Training Matrix

How this form works. One row per employee, one column per required topic. Enter the **completion date** in the cell. Where a topic expires, enter the **expiry date** beneath it. **A cell that is blank, or that shows a date in the past, means that employee does not perform the task that topic covers — the Competent Person checks this matrix before every mobilization and again whenever a new task starts.** The Treasurer maintains the master; a current copy travels in the site safety file.

Project: _____ Matrix current as of (date): _____

Maintained by: **Derek Snow, Treasurer** — signature: _____

Employee (print name)	Role	OSHA 10 / 30 (card no. + date)	HazCom	Silica — 1926.1153(i)	Excavation — Subpart P	Fall protectio required)
Jean Prinsloo	Site Superintendent / Competent Person (MA CS-122896)					
Derek Snow	Treasurer / alternate Competent Person					

Employee (print name)	Role	OSHA 10 / 30 (card no. + date)	HazCom	Silica — 1926.1153(i)	Excavation — Subpart P	Fall protectio required)

Expiry and refresher tracking. Enter the next-due date for each recurring item:

Respirator fit test — annual (29 CFR 1910.134(f)(2)). Next due: _____

First Aid / CPR / AED — 2 years. Next due: _____

Silica refresher — ESC baseline: annual. Next due: _____

Fall protection refresher — ESC baseline: annual, and on any 1926.503(c) trigger. Next due: _____

Excavation refresher — ESC baseline: annual. Next due: _____

Overhead power line refresher — ESC baseline: annual. Next due: _____

Stop-work authority — restated at every daily briefing; formal refresher: annual. Next due: _____

Verification of understanding. For each training event ESC records the topic, date, duration, trainer name and qualifications, the method used to verify understanding (discussion, quiz, or hands-on demonstration), and the employee's signature. **Fall protection training is certified in writing per 29 CFR 1926.503(b)(1)** — employee name, date of training, and the signature of the person who conducted the training or of the employer.

Trainer (print): _____ Qualifications: _____

Trainer signature: _____ Date: _____

PART 2 — HEALTH HAZARDS, PPE & EXPOSURE CONTROL

Earth Support Corp. ("ESC") self-performs deep foundation and earth retention work — drilled-pier caissons, soil-nail walls, shoring and support of excavation, underpinning and slope stabilization. That work generates the health hazards addressed in this Part: respirable crystalline silica from rock coring and concrete cutting, high noise from drill rigs and percussion tooling, chemical exposure from cement, grout, fuels and lubricants, whole-body and hand-arm vibration, heat and cold, and the possibility of encountering contaminated soil.

Federal OSHA (29 CFR Part 1926) applies to ESC's private-sector construction work in Massachusetts; Massachusetts has no state OSHA plan covering private-sector construction. ESC had 10 or fewer employees at all times during 2023, 2024 and 2025 and is therefore partially exempt from routine injury/illness recordkeeping under 29 CFR 1904.1. **That exemption reaches only the OSHA 300 log. It does not exempt ESC from any requirement in this Part.** The silica standard, the respiratory protection standard, the noise standard, the hazard communication standard and the PPE standards apply to ESC in full, regardless of company size. ESC must still report a fatality within 8 hours and any in-patient hospitalization, amputation or loss of an eye within 24 hours per 29 CFR 1904.39.

Company-wide responsibility for this Part rests with Derek Snow, Treasurer. Field implementation and the designated Competent Person role rests with Jean Prinsloo (MA Construction Supervisor License CS-122896).

2.1 Hazard Communication Program (29 CFR 1926.59 / 29 CFR 1910.1200)

29 CFR 1926.59 adopts the Hazard Communication Standard, 29 CFR 1910.1200, in full for construction. ESC maintains a written hazard communication program as required by 1910.1200(e)(1).

2.1.1 Purpose and scope

This program applies to every hazardous chemical ESC brings onto, produces at, or is knowingly exposed to at a jobsite. It covers ESC employees and, through the general contractor, informs other on-site employers of hazards ESC creates (1910.1200(e)(2)).

2.1.2 Program administration

Role	Person	Duty
Program owner	Derek Snow, Treasurer	Approves the program, maintains the master chemical list, obtains SDSs from suppliers, funds training
Site implementation	Jean Prinsloo, CS-122896	Maintains the site SDS binder, verifies container labeling, delivers/documents training, stops work on an unlabeled or unknown chemical
Employees	All	Read labels and SDSs before use; use the specified controls and PPE; report missing labels or SDSs

2.1.3 ESC chemical inventory

ESC maintains a written list of the hazardous chemicals known to be present, using an identity that matches the SDS, per 1910.1200(e)(1)(i). ESC's standing inventory is:

Chemical / product	Where used on ESC work	Principal GHS hazards (confirm against the current SDS)
Portland cement, ready-mix concrete, cement powder	Pier/caisson concrete, grout mixes	Skin corrosion/irritation; serious eye damage; skin sensitization (hexavalent chromium); STOT-RE via respirable crystalline silica in aggregate
Cementitious grout / neat cement grout	Soil nails, micropiles, annulus grouting	As above
Concrete admixtures and chemical grouts	Accelerators, retarders, water reducers and plasticizers supplied with the ready-mix design; chemical grout where a specification calls for it	Product-specific. The GHS hazards are taken verbatim from Section 2 of that product's SDS and entered on the project inventory **before** the product is delivered. Typical hazards are skin and eye irritation and skin sensitization; isocyanate-based grouts add respiratory sensitization. No admixture or chemical grout enters an ESC site without its SDS already in the binder.
Diesel fuel (rig, excavator, pumps, generator)	Equipment fueling	Flammable liquid; aspiration toxicity; skin irritation; suspected carcinogen (diesel exhaust)
Hydraulic oil	Drill rig, excavator, breaker circuits	Skin irritation; injection injury hazard under pressure; combustible
Engine oil, gear oil, grease	Equipment maintenance	Skin irritation; used oil is a suspected carcinogen
Form release agent	Pier caps, formwork	Skin/eye irritation; combustible; may contain petroleum distillates
Solvents / parts cleaner / brake cleaner	Tool and equipment cleaning	Flammable; CNS depression; skin defatting
Aerosol marking paint	Utility and layout marking	Extremely flammable aerosol; CNS effects
Two-cycle fuel/oil mix	Cut-off saw, mixers	Flammable liquid; aspiration
Compressed gases — oxygen and acetylene	Torch cutting of casing, rebar and worn tooling. Cylinders come onto a site only for a shift on which a written ESC hot work permit has been issued; on every other shift there is no fuel gas on the site.	Oxidizer; extremely flammable gas; gas under pressure
Bedrock, drill cuttings, spoil, concrete dust	Drilling, coring, cutting, chipping	**Respirable crystalline silica** — carcinogen; lung, immune system and kidney effects. Controlled under Section 2.3.

Jean Prinsloo will review and update this inventory before each mobilization and whenever a new product is introduced. Chemicals not on this list may not be brought onto an ESC worksite without approval and an SDS in hand.

Project-specific product entry — any admixture, chemical grout, curing compound or other product not already on the standing inventory above is entered here and on the Chemical Inventory and SDS Index (Appendix 2-E) before it is delivered:

Product (identity exactly as it appears on the SDS): _____

Manufacturer: _____ Where used: _____

GHS hazards from SDS Section 2: _____

SDS in the site binder: □ Entered by: _____ Date: _____

2.1.4 Safety Data Sheets

1. ESC will obtain and maintain an SDS for each hazardous chemical on the inventory (1910.1200(g)(1)) and will not accept delivery of a product without one.
2. SDSs will be kept in a labeled binder in the site job box and truck, **accessible to every employee during every work shift without asking permission and without leaving the work area** (1910.1200(g)(8)). An electronic copy on the site tablet/phone is acceptable as a backup, not as the sole means of access, because a device failure or dead battery is a loss of access.
3. If an SDS is missing, Jean Prinsloo will request it from the supplier immediately and the product will not be used until the SDS is on site.
4. SDSs follow the 16-section GHS format. Employees will be trained to go to Section 2 (hazards), Section 4 (first aid), Section 7 (handling/storage) and Section 8 (exposure limits/PPE) first.

2.1.5 Labels and container labeling

1. Shipped containers must arrive with the supplier's GHS label: product identifier, signal word, hazard statement(s), pictogram(s), precautionary statement(s), and the supplier's name/address/phone (1910.1200(f)(1)). Employees must not deface or remove these labels.
2. **Workplace/secondary containers** (a fuel can, a solvent squirt bottle, a mixing bucket) must be labeled with the product identifier and words/pictures/symbols conveying the hazards, per 1910.1200(f)(6). ESC will use pre-printed secondary labels.
3. The only exception is the portable container into which a chemical is transferred from a labeled container **for the immediate use of the employee who performs the transfer, within that work shift** (1910.1200(f)(8)). Anything set down, left overnight, or handed to another employee must be labeled.

2.1.6 Employee information and training

Training is provided at initial assignment and whenever a new physical or health hazard is introduced into the work area (1910.1200(h)(1)). It covers, at minimum:

- The requirements of the HazCom standard and the location of ESC's written program, chemical list and SDSs;
- Operations in the work area where hazardous chemicals are present;
- Methods employees can use to detect a release (visual, odor, monitoring);
- The physical, health, simple asphyxiation, combustible dust and pyrophoric gas hazards of the chemicals in the area;
- Protective measures — work practices, engineering controls, emergency procedures and PPE;
- The details of the labeling system, GHS pictograms and signal words, and how to read an SDS.

Crystalline silica is included in this program as required by 29 CFR 1926.1153(i)(1), and the training must expressly address **cancer, lung effects, immune system effects and kidney effects**.

Training record — Date: _____ Trainer: _____ Signed attendee roster attached: □

2.1.7 Multi-employer sites

ESC works as a subcontractor. Before starting work ESC will:

1. Provide the general contractor with a copy of this HazCom program, ESC's chemical inventory and the corresponding SDSs, so the GC can inform other trades of hazards ESC creates (1910.1200(e)(2)).
2. Request from the general contractor the SDSs and hazard information for chemicals **other** employers bring on site that could expose ESC employees, and the GC's labeling and precautionary measures.
3. Escalate to the general contractor in writing when another employer's chemical or dust exposure reaches ESC's crew. Jean Prinsloo has authority to move ESC's crew or stop ESC's work pending resolution.

2.1.8 Cement and wet-concrete burn prevention (specific ESC hazard)

Wet cement, concrete and grout are strongly alkaline and cause chemical burns that are painless while they are occurring. ESC's mandatory rules:

- No skin contact with wet concrete, grout or cement powder. Alkali-resistant gloves, long sleeves, long pants, and rubber boots (taped or tucked at the top) whenever placing, screeding, or vibrating concrete or mixing grout.
- Sealed eye protection (goggles) whenever mixing dry cement or grout powder, or where splashing is possible.
- No kneeling in fresh concrete. Waterproof knee pads if kneeling is unavoidable.
- Wash stations with clean water and pH-neutral soap on site whenever concrete or grout is placed. Flush skin contact immediately and continuously. Flush eyes for at least 15 minutes and seek medical attention.
- Concrete-soaked clothing and boots must be removed immediately, not worn out the shift.

2.2 Personal Protective Equipment Program (29 CFR 1926 Subpart E)

2.2.1 Hazard assessment and employer duty

29 CFR 1926.28(a) requires the employer to require the wearing of appropriate PPE in all operations where there is an exposure to hazardous conditions. 29 CFR 1926.95(a) requires PPE to be provided, used and maintained wherever hazards capable of causing injury or impairment are encountered. Per 1926.95(d), ESC pays for all required PPE at no cost to the employee, with the standard's limited exceptions (non-specialty safety-toe footwear and non-specialty prescription safety eyewear that the employee is allowed to take off site, and ordinary weather gear).

Jean Prinsloo, as Competent Person, performs and documents a **written PPE hazard assessment for each project and for each new task**, identifying the hazard, the affected employee, and the PPE selected. The assessment is completed and signed **before mobilization**, not after the crew is on site, and is reassessed whenever a new task is added. The PPE hazard assessment for each project is recorded on the PPE Hazard Assessment Form, **Appendix 2-C**, and is certified there:

PPE hazard assessment completed by: _____ Date completed: _____

Reassessed on introduction of a new task — task: _____ Date: _____

Employee-owned PPE may be used only if ESC verifies its adequacy, including proper maintenance and sanitation (1926.95(b)). Defective or damaged PPE must not be used (1926.95(c)).

2.2.2 Baseline PPE — worn by every ESC employee, every day, on every site

- Hard hat (Section 2.2.3)
- Safety glasses with side protection (Section 2.2.4)
- High-visibility apparel (Section 2.2.8)
- Work gloves appropriate to the task (Section 2.2.6)
- Protective footwear (Section 2.2.7)
- Long pants; shirt with at least a 4-inch sleeve
- Hearing protection whenever the rig, breaker, saw or hammer is running (Section 2.5)

2.2.3 Head protection (29 CFR 1926.100)

1. Hard hats are required wherever there is a possible danger of head injury from impact, falling or flying objects, or electrical shock and burns (1926.100(a)).
2. Head protection must comply with ANSI Z89.1 as incorporated at 1926.100(b)(1)–(2). ESC issues **Type I or Type II, Class E** (electrical, 20,000 V rated) head protection. Class E is specified because ESC works near overhead conductors on drill-rig sites.
3. Hard hats are worn brim-forward unless the manufacturer certifies reverse wear. No metal hard hats. No modifications, no drilling, no unapproved stickers over cracks.
4. Hard hats are inspected before each use and removed from service after any impact, or on any sign of cracking, crazing, chalking or a damaged suspension. Replacement interval: per manufacturer, or immediately on damage.
5. **Working under a suspended load, an auger, a kelly bar or a rebar cage is prohibited** — a hard hat is not a control for that hazard. See ANSI/ASSP A10.23 §12.16.

2.2.4 Eye and face protection (29 CFR 1926.102)

1. Eye and face protection is required where machines or operations present potential eye or face injury from physical, chemical or radiation agents (1926.102(a)(1)); protectors must comply with the ANSI Z87.1 editions incorporated at 1926.102(a)(2)–(3).
2. **Minimum for all ESC field work:** ANSI Z87.1-rated safety glasses with side shields.

3. **Sealed goggles required for:** mixing dry cement/grout powder; any wet-cutting, wet-coring or wet-drilling operation producing slurry spray; chipping, breaking or hoe-ramming concrete or rock; grinding; handling drill cuttings in wind; any operation where a chemical splash is foreseeable.
4. **Face shield worn over safety glasses (not instead of):** operating a chipping hammer or breaker; grinding; cutting with an abrasive saw; pressure-washing; handling acids or alkalis. A face shield alone is not primary eye protection.
5. Welding/cutting: filter lenses with the shade number required by 1926.102(b) and the tables therein; a shade appropriate to the operation, and screening to protect nearby workers.
6. Employees who wear prescription glasses must wear eye protection that incorporates the prescription in its design or that can be worn over the prescription lenses without disturbing their proper position (1926.102(a)(3)).

2.2.5 Hearing protection

Covered in Section 2.5 (Occupational Noise Exposure and Hearing Conservation).

2.2.6 Hand protection (29 CFR 1926.95; 1910.138 by reference)

Gloves are selected for the hazard. Employees must not wear a glove that is the wrong tool for the job.

Task	Glove
General material handling, rigging, casing, tooling	Cut-resistant leather or coated-palm glove, **minimum ANSI/ISEA 105 cut level A4**, with impact protection on the back of the hand. The PPE hazard assessment (Appendix 2-C) raises the cut level above A4 where a task presents a sharper hazard — broken wire rope, sheared casing edge, cut rebar. It never lowers it below A4.
Handling wire rope, cable, drill string	Leather with cut resistance; **no fingerless gloves**
Wet concrete, grout, cement	Alkali-resistant nitrile or rubber gauntlet gloves, cuff over the sleeve
Fuels, oils, solvents, form release	Chemical-resistant nitrile per the SDS Section 8 breakthrough data
Hot work / cutting	Leather welding gloves
Cold weather	Insulated, water-resistant gloves; see Section 2.7
Vibrating tools	See Section 2.8 — anti-vibration gloves are a supplement, not a control

Prohibited: gloves near rotating equipment (drill string, kelly, auger, augercast head, mixer paddle, drill motor) where the glove can be caught and pull the hand in. Employees must never place a hand on or near rotating tooling. Loose cuffs, rings, watches and jewelry are prohibited around rotating equipment.

2.2.7 Foot protection (29 CFR 1926.96)

1. Safety-toe footwear meeting the ASTM standards incorporated by 1926.96 (ASTM F2413 / previously ANSI Z41) is required for all field employees.
2. ESC specifies footwear marked at minimum **ASTM F2413, I/75 C/75, EH** (electrical hazard). Puncture-resistant (PR) soles are required for anyone walking spoil piles, demolition debris or areas with exposed rebar and form nails.
3. Boots must be over the ankle, laced and in serviceable condition. No sneakers, no low-cut shoes, no worn-through soles.
4. Rubber boots are required for concrete placement and grouting; they must be tall enough to keep concrete off the skin, and must not be allowed to fill with concrete.

2.2.8 High-visibility apparel

1. Required at all times on ESC sites. ESC work is routinely performed in or adjacent to live traffic, active parking lots and areas of moving heavy equipment.
2. **ANSI/ISEA 107 Class 2** high-visibility garment minimum. **Class 3** (sleeved garment or vest plus hi-vis trousers/sleeves) is required for night work, low-light or poor-visibility conditions, and for anyone acting as a spotter, signal person or flagger near moving equipment or traffic.
3. Where work occurs within a public right-of-way on a Federal-aid highway, high-visibility apparel meeting 23 CFR 634 and the MUTCD applies; ESC will comply with whichever standard is stricter.
4. Hi-vis apparel that is soiled with concrete, mud, or oil to the point that its retroreflectivity or fluorescence is compromised must be replaced.

2.2.9 Fall protection PPE, respirators, and other PPE

Personal fall arrest systems are addressed in **Part 3, §3.9 (Open Shaft Protection)** and **Part 4, §4.4.7**. Respirators are addressed in Section 2.4. Life jackets/work vests are required for work over or near water per 1926.106 (not anticipated on current ESC work; if encountered, see ANSI/ASSP A10.23 §16).

2.2.10 PPE training, care and enforcement

Employees are trained on: when PPE is necessary; what PPE is necessary; how to don, doff, adjust and wear it; its limitations; and its proper care, maintenance, useful life and disposal. Training record — Date: _____ Trainer: _____ Signed roster attached: □

PPE is inspected before each use. Damaged PPE is removed from service and replaced at ESC's cost. Refusal to wear required PPE is grounds for removal from the site and progressive discipline under **Part 1, Section 1.7 (Accountability and Disciplinary Policy)**.

2.3 Respirable Crystalline Silica — Written Exposure Control Plan (29 CFR 1926.1153)

This Section 2.3, together with the ESC Competent Person checklist at Appendix 2-A and the silica task-duration log at Appendix 2-B, constitutes ESC's written exposure control plan required by 29 CFR 1926.1153(g)(1). It is a company-wide plan covering all ESC self-performed work, with a project addendum for each job.

Plan owner and signatory: Derek Snow, Treasurer. **Effective date: July 14, 2026** (Revision 1.0). Last annual review: *not applicable — initial issue*. **Next review due: July 14, 2027.**
Designated Competent Person: **Jean Prinsloo**, MA CS-122896.

2.3.1 Applicability, action level and PEL

29 CFR 1926.1153(a) states the standard "applies to all occupational exposures to respirable crystalline silica in construction work, except where employee exposure will remain below 25 micrograms per cubic meter of air (25 μg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions."

- **Action level (AL): 25 μg/m³ as an 8-hour TWA**, per 1926.1153(b).
- **Permissible exposure limit (PEL): 50 μg/m³ as an 8-hour TWA**, per 1926.1153(d)(1).

ESC is squarely within the scope of the standard. ESC drills and cores rock, cuts and chips concrete and asphalt, hoe-rams boulders, and handles dry rock cuttings — all of which foreseeably generate respirable crystalline silica above the action level. ESC does **not** claim the below-25 μg/m³ exemption. OSHA's Small Entity Compliance Guide is explicit that the exemption is unavailable where low exposures are achieved only because engineering controls are being used, and that a control failure is a "reasonably foreseeable" condition.

ESC's small-employer status under 29 CFR 1904.1 has no bearing on this standard. Every requirement of 1926.1153 applies to ESC in full.

Tasks OSHA identifies as normally below the action level when performed in isolation, and which ESC therefore does not treat as silica tasks when they occur alone: mixing small quantities of mortar or concrete; pouring concrete footings, slabs and foundation walls; removing concrete formwork; working with intentionally wet products such as grout. These are listed here so ESC's task inventory is complete and defensible. When any of these occur on a shift in which the same employee also performs a Table 1 task, the Table 1 duration rules of Section 2.3.4 govern.

2.3.2 §(g)(1)(i) — Silica-containing materials and tasks

Materials ESC disturbs that contain crystalline silica: bedrock (New England crystalline bedrock — granite, granodiorite, gneiss; typical quartz content of granite/gneiss ranges from roughly 3% to 45%+ by volume — for each project the Competent Person reads the **geotechnical report of record** and records the depth to rock, the rock type, the RQD, whether coring/socketing is required, the boulders logged, and the groundwater depth, on the exposure control plan before mobilization); boulders and cobbles; glacial till; asphalt and concrete pavement; structural concrete; grout and mortar; and the drill cuttings and spoil generated from all of the above.

ESC task inventory:

#	Task	Equipment	Location	Compliance pathway
1	Drilled-shaft / caisson drilling and rock socketing	Vehicle-mounted (crawler/carrier) drill rig	Outdoors	Table 1 entry **(ix)**
2	Rock and concrete coring (pavement cores, soft-dig windows, anchor cores)	Rig-mounted core saw/drill	Outdoors	Table 1 entry **(vi)**

#	Task	Equipment	Location	Compliance pathway
3	Pavement/slab saw-cutting	Walk-behind saw	Outdoors	Table 1 entry **(iv)** — **PREFERRED**
4	Pavement/slab/concrete cutting where a walk-behind will not fit	Handheld power saw	Outdoors	Table 1 entry **(ii)**
5	Chipping pier tops to cut-off elevation; breaking pavement, curb and obstruction concrete	Jackhammer / handheld powered chipping tool	Outdoors	Table 1 entry **(x)**
6	Drilling anchor, dowel and template holes in concrete or rock	Handheld/stand-mounted rotary hammer	Outdoors	Table 1 entry **(vii)**
7	Grinding pier tops, bearing surfaces, weld areas	Handheld grinder	Outdoors	Table 1 entry **(xii)**
8	Hoe-ramming / breaking boulders, obstructions, top of rock	Excavator with hydraulic hammer	Outdoors	Table 1 entry **(xvii)**
9	Excavating, grading, spoil and cuttings handling, loading out, backfill	Excavator, loader, trucks	Outdoors	Table 1 entry **(xviii)**
10	Cleaning up saw/core slurry and dried cuttings	Wet vacuum/HEPA vacuum, shovel, squeegee	Outdoors	Housekeeping — §(f); see 2.3.6
11	**Air-flush DTH / percussion rock drilling with no water and no close-capture collection — IF USED**	DTH hammer / percussion drill	Outdoors	**NOT Table 1** → paragraph **(d)**; see 2.3.5

Outdoor determination. ESC's work is characteristically performed **outdoors, in open lots and open sites**, and the Competent Person makes and records this determination for each project. The Table 1 "outdoors" respirator columns therefore apply, and no supplemental exhaust ventilation is required under 1926.1153(c)(2)(i). If ESC ever works beneath a completed carport canopy with limiting side structure, inside a parking deck, in a garage, or in any open-top structure with three walls or a roof that limits dust dispersal, the Competent Person will re-classify the area as "indoors or in an enclosed area," apply the stricter respirator columns, and provide mechanical exhaust.

NO MAN-ENTRY. ESC prohibits entry by any person into any drilled shaft. Shafts are never entered. Cleanout is by tooling only (cleanout/muck bucket, airlift or pump). This eliminates the single highest-exposure silica scenario in caisson work. If entry were ever contemplated it would be a permit-required confined space and is prohibited absent a written program, full-depth casing, atmospheric monitoring, an attendant, a retrieval system and a pre-arranged technical rescue plan — none of which ESC maintains, because ESC does not enter shafts.

2.3.3 §(g)(1)(ii) — Engineering controls, work practices and respiratory protection, by task

ESC's primary compliance pathway is **Table 1, 29 CFR 1926.1153(c)(1)**. Where ESC fully and properly implements the Table 1 controls for a task, no exposure assessment, no air monitoring and no PEL-compliance obligation attaches to that task, and per 1926.1153(e)(3) ESC is deemed in compliance with the respirator-selection provisions of 1910.134(d)(1)(iii) and (d)(3). Pathways may be selected task by task.

Mandatory conditions on all Table 1 controls, per 1926.1153(c)(2):

- For wet methods: **apply water at flow rates sufficient to minimize the release of visible dust** — 1926.1153(c)(2)(ii). **Visible dust means the control has failed.** Any employee seeing visible dust must stop and adjust; the Competent Person has stop-work authority.
- For indoor/enclosed areas: provide exhaust as needed to minimize accumulation of visible airborne dust — 1926.1153(c)(2)(i).
- In freezing conditions, ESC will protect water systems from freezing (heated tote, drained lines, or an environmentally acceptable antifreeze additive). If the water system freezes, the wet control has failed and the task stops.

"Employee engaged in the task" includes the equipment operator; helpers, laborers and other employees assisting with the task; and any other employee responsible for completing the task. The oiler/laborer at the hole is engaged in the task. His time counts toward the 4-hour trigger and he receives the same respiratory protection as the operator. **An operator inside an enclosed cab does not protect the person standing at the hole.**

Task 1 — Drilled-shaft/caisson drilling and rock socketing (Table 1 (ix), vehicle-mounted drilling rigs for rock and concrete)

Controls. ESC will implement, fully and properly, **one** of the two options in Table 1 (ix):

- **Option A — Enclosed cab + water at the bit.** Operate from within an enclosed cab and use water for dust suppression on the drill bit. Because the oiler/laborer at the hole is not in the cab, **water at the bit is required to protect him.** The cab must meet 29 CFR 1926.1153(c)(2)(iii)(A)–(F): maintained as free as practicable from settled dust; door seals and closing mechanisms working properly; gaskets and seals in good condition; **under positive pressure maintained through continuous delivery of fresh air**; intake air filtered through a filter **95% efficient in the 0.3–10.0 µm range (MERV-16 or better)**; and with heating and cooling capability. **The cab relied on for Option A is the enclosed cab of the drill rig.** Option A may not be claimed on any project until the Competent Person has verified all six cab conditions against the rig's operator's manual and the cab-filter specification, and has confirmed the filter's efficiency rating from the filter manufacturer's data sheet. Post the cab-filter part number and its rating in the cab and record it on the Competent Person checklist (Appendix 2-A) each shift. **If the cab does not meet every one of (A)–(F), ESC may not claim this option and must use Option B.** This is a real gate, not a formality: a cab without positive pressure and a MERV-16-or-better intake filter is a cab that is protecting nobody.

Rig: the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization Serial no.: _____

Cab air filter part no.: _____ Efficiency rating (MERV 16 or better): _____

Filter last changed: _____ Next change due (per manufacturer): _____

Cab conditions (A)–(F) verified this shift: □ Verified by: _____ Date: _____

- **Option B — Dust collection.** Use a dust collection system with a close-capture hood or shroud around the drill bit, with a low-flow water spray to wet the dust at the discharge point from the dust collector.

Dust collector — make/model: _____ Filter efficiency (≥99%): _____ Filter-cleaning mechanism: □

Shroud/close-capture hood installed per manufacturer's instructions: □ Water spray at collector discharge running: □

Work practices.

- Keep the shaft and the tooling **wet**. Use water injection or a wet flush during rock socketing; maintain water in the cased shaft. Use a rock auger or core barrel rather than a dry air-flush percussion hammer.
- Wet the cuttings as they come out of the hole. Wet the spoil pile. Wet the auger or core barrel before spinning it off.
- **Never blow off the auger, tooling, rig deck or drill string with compressed air** (see 2.3.6).
- Cleanout is **by tooling only** — no man-entry.
- Daily/shift Competent Person check: adequate water supply on site (water truck / tote / hose bib); spray nozzles working, unclogged, undamaged and aimed at the bit or the collector discharge; all hoses and connections intact, no kinks or tight bends; shroud/hood intact and installed per the manufacturer's instructions; dust collector filter cleaned or changed per the manufacturer's instructions; dust collection bag emptied so it does not overfill; cab sealed, HVAC running, kept closed and free of settled dust; **no visible dust**.

Respiratory protection. None required under Table 1 (ix), at any task duration, when the selected option is fully and properly implemented.

Task 2 — Rock and concrete coring (Table 1 (vi), rig-mounted core saws or drills)

Controls. Use a tool equipped with an **integrated water delivery system that supplies water to the cutting surface**. Operate and maintain the tool per the manufacturer's instructions to minimize dust emissions. Water flow must be sufficient to minimize the release of visible dust.

Work practices. Verify hoses are securely connected and not cracked or broken. Adjust nozzles so water reaches the blade/bit and wets the cutting area. Inspect the bit for excessive wear. **Clean up all slurry before it dries** — shovel it wet into a sealed container, or use a wet vacuum with a HEPA filter. Because water and electricity are combined, use GFCI protection and watertight, sealable connectors on all electric core drills.

Prohibition. ESC will **not** operate a rig-mounted core drill dry with a vacuum dust collection system and treat it as Table 1 compliant. Per OSHA Fact Sheet OSHA 3929, when a rig-mounted core drill is operated with a VDCS instead of wet methods, **Table 1 does not apply** and the task becomes a paragraph (d) task requiring an exposure assessment.

Respiratory protection. None required, at any duration, when run wet per Table 1 (vi).

Task 3 — Walk-behind pavement/slab sawing (Table 1 (iv)) — PREFERRED METHOD

Controls. Use a saw with an **integrated water delivery system that continuously feeds water to the blade**. Operate and maintain per the manufacturer's instructions.

Respiratory protection. Outdoors: **none required at any duration.**

ESC policy. Wherever geometry permits, ESC will use the **wet walk-behind saw rather than a handheld cut-off saw**, because outdoors the walk-behind requires no respirator at any duration while the handheld saw crosses to APF 10 past four hours. This is a deliberate control-selection decision and it must be honored in the field.

Task 4 — Handheld power sawing (Table 1 (ii))

Controls. Use a saw with an **integrated water delivery system that continuously feeds water to the blade**. Operate and maintain per the manufacturer's instructions. There is **no dry/vacuum option in Table 1 for saws** — water is the only listed control.

Respiratory protection. Outdoors: **none required at ≤4 hours per shift; APF 10 required if the task exceeds 4 hours per shift.** Indoors or in an enclosed area: APF 10 at any duration.

Task 5 — Chipping, jackhammering and breaking concrete/rock (Table 1 (x)) — ESC's principal respirator trigger

Controls. Use **either**:

- a tool with a **water delivery system that supplies a continuous stream or spray of water at the point of impact**; **or**
- a tool equipped with a **commercially available shroud and dust collection system**, operated and maintained per the manufacturer's instructions, where the dust collector provides **the airflow recommended by the tool manufacturer or greater**, and has a filter with **99% or greater efficiency and a filter-cleaning mechanism**.

Respiratory protection. Outdoors: **none at ≤4 hours; APF 10 if the task exceeds 4 hours.** Indoors or enclosed: APF 10 at any duration.
A respirator does not substitute for the engineering control. Water or a shroud/collector is required in every case.

Task 6 — Rotary-hammer drilling of anchor/dowel/template holes (Table 1 (vii))

Controls. Use a drill equipped with a **commercially available shroud or cowling with a dust collection system**. Operate and maintain per the manufacturer's instructions. The dust collector must provide **the airflow recommended by the tool manufacturer or greater**, and have a filter with **99% or greater efficiency and a filter-cleaning mechanism**. **Use a HEPA-filtered vacuum when cleaning holes.**

Prohibition. Never blow drilled holes out with compressed air unless the compressed air is used together with a ventilation system that effectively captures the dust cloud (1926.1153(f)(2)). Use the HEPA vacuum.

Hardware confirmed on site before mobilization. Table 1 (vii) is only satisfied if the extractor moves the air the *tool manufacturer* asks for. **Read the required airflow out of the rotary hammer's operator's manual, read the delivered airflow off the dust extractor's data plate, and confirm the extractor meets or exceeds it — in writing, before the tool leaves the yard.** The filter must be 99% efficient or better and have a filter-cleaning mechanism. A HEPA vacuum is on the truck before the first hole is drilled: **no HEPA vacuum, no hole cleaning, no drilling.**

Rotary hammer — make/model: _____ OEM dust shroud/cowling: _____

Dust extractor — make/model: _____ Rated airflow: _____ CFM

Airflow required by the tool manufacturer: _____ CFM Extractor meets or exceeds it: □

Filter ≥99% efficient with a filter-cleaning mechanism: □ HEPA vacuum — make/model: _____

Confirmed by: _____ Date: _____

Respiratory protection. None required, at any duration, including overhead drilling.

Task 7 — Handheld grinding, other than mortar removal (Table 1 (xii))

Controls. Outdoors, **either**:

- a grinder with an **integrated water delivery system that continuously feeds water to the grinding surface** (wet grinding is a Table 1 option **outdoors only**); **or**
- a grinder with a **commercially available shroud and dust collection system** providing **at least 25 CFM of airflow per inch of wheel diameter** (e.g., ≥125 CFM for a 5-inch wheel), with a filter of **99% or greater efficiency** and a **cyclonic pre-separator or filter-cleaning mechanism**.

Respiratory protection. Outdoors: **none required at any duration.** Indoors/enclosed with the shroud option: none at ≤4 hours; APF 10 above 4 hours.

Task 8 — Hoe-ramming, rock ripping, breaking boulders and obstructions (Table 1 (xvii))

Controls. Operate the equipment **from within an enclosed cab**. **When employees outside the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.** On ESC work a laborer or spotter is virtually always engaged in the task outside the cab, so **water/dust suppression is required in practice, not optional.**

Work practices. Keep a hose, water tote and hand-held misting wand at the work point. Apply water at flow rates sufficient to minimize the release of visible dust — too little water does not control dust; too much creates a mud slurry and a slip/traction hazard. Time the application so material is still damp when it is disturbed.

Respiratory protection. None required at any duration.

Task 9 — Excavating, grading, spoil and cuttings handling (Table 1 (xviii))

Controls. Apply water and/or dust suppressants as necessary to minimize dust emissions. The enclosed-cab-only option under (xviii) is available **only when the equipment operator is the only employee engaged in the task** — on ESC sites, with spotters, flaggers and laborers present, it usually is not. ESC's default is therefore **water/dust suppression.**

Work practices. Wet drill cuttings and rock spoil as they come out of the hole, wet the spoil pile, and wet material before it is loaded into trucks. Dry hard-rock cuttings from above the water table are the dustiest material on the site and require the most attention. Acceptable water application methods include tank trucks with hoses and nozzles, an employee applying water with a wand, atomized misting devices, and spray equipment mounted on the vehicle.

Respiratory protection. None required at any duration.

Tasks that are out of scope when performed in isolation

Mixing small quantities of mortar/concrete; pouring the pier concrete; stripping formwork; working with intentionally wet grout. OSHA identifies these as normally below the action level when done in isolation. **They are not exempt if the same employee also performs Table 1 tasks that shift** — see Section 2.3.4.

2.3.4 The 4-hour rule and task-duration aggregation (29 CFR 1926.1153(c)(3))

29 CFR 1926.1153(c)(3): "Where an employee performs more than one task on Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift."

How ESC counts duration:

1. Time starts when the employee begins using the tool and runs until the task is complete — **including intermittent breaks in tool use and including clean-up.**
2. Tasks performed in separate periods during the day are **combined**, not counted separately.
3. A "shift" includes a standard 8-hour day, a split day, a shift longer than 8 hours, a double shift, and a work period spanning two calendar days.
4. If a respirator is required because the total exceeds 4 hours, it must be worn **for the entire duration of each affected task — not merely the time past the first four hours.**
5. If a task is estimated at 4 hours or less but overruns, ESC will provide the required respiratory protection **as soon as it becomes evident that the task may exceed 4 hours**, measured from the beginning of the task.

Worked example ESC crews must understand: A laborer saw-cuts pavement with a handheld saw for 2 hours and chips pier tops for 3 hours. Total Table 1 time = 5 hours. The ">4 hour" column now applies to **both** tasks. **An APF 10 respirator is required for the sawing and for the chipping, for the whole of each task.**

ESC procedure.

- Jean Prinsloo will maintain a **daily silica task-duration log** (Appendix 2-B) recording, per employee per shift, each Table 1 task and its start/stop times.
- The Competent Person will **sequence and split silica tasks among crew members** to keep individual totals under 4 hours wherever practical.
- **Fallback:** ESC will keep half-mask elastomeric respirators with P100 filters on site and will maintain a **fit-tested, medically evaluated crew** at all times, so that a 4-hour overrun is a planning inconvenience and not a violation. Every field employee's current fit-test status is carried on the Respirator Medical Evaluation / Fit Test Roster (Appendix 2-F), one line per employee, and no employee whose fit test has lapsed may be assigned a task that could cross four hours:

Employee: _____ Respirator make / model / size: _____

Fit-test method (QNFT / QLFT): _____ Fit-test date: _____ Next due (12 months): _____

2.3.5 Alternative exposure control methods — 29 CFR 1926.1153(d)

Any task ESC does not run fully and properly per Table 1, and any task not on Table 1, falls under paragraph (d). **The realistic candidate on ESC work is dry, air-flush DTH or percussion rock drilling, and any dry vacuum-only coring.** ESC states plainly: **Table 1 (ix) does not cover an air-flush rock drill run with no water and no close-capture collection**, and ESC will not pretend otherwise.

ESC's default method is to keep the rock drilling wet (water/foam injection or wet flush, casing charged with water, core barrel or rock auger rather than air-flush percussion), which keeps the task inside Table 1 (ix). Groundwater conditions often place the rock socket below the water table, which supports this method.

If ESC ever runs a dry air-flush hammer or a dry vacuum-only core drill, that task becomes a paragraph (d) task and ESC will:

1. **Comply with the PEL** — no employee exposed above 50 µg/m³ as an 8-hour TWA (1926.1153(d)(1)).
2. **Assess exposure** for each employee who is or may reasonably be expected to be exposed at or above the action level (1926.1153(d)(2)(i)), using either:
   - the **performance option** (1926.1153(d)(2)(ii)) — any combination of air monitoring data and/or objective data sufficient to accurately characterize employee exposures; or
   - the **scheduled monitoring option** (1926.1153(d)(2)(iii)) — initial personal breathing-zone samples representing the 8-hour TWA for each employee on each shift, job classification and work area; where representative sampling is used, ESC will sample the employee(s) expected to have the **highest** exposure. Re-monitoring: if the result is **below the AL**, monitoring may be discontinued; if **at or above the AL but at or below the PEL**, repeat **within 6 months**; if **above the PEL**, repeat **within 3 months**; if a non-initial result is below the AL, repeat within 6 months until **two consecutive measurements taken 7 or more days apart are below the AL**, after which monitoring may be discontinued.
3. **Reassess** whenever a change in production, process, control equipment, personnel or work practices may reasonably be expected to result in new or additional exposures at or above the AL (1926.1153(d)(2)(iv)).
4. **Use an accredited laboratory** (1926.1153(d)(2)(v) and Appendix A): analysis by **OSHA ID-142, NIOSH NMAM 7500, 7602 or 7603, or MSHA P-2 or P-7**; the lab must be **ISO/IEC 17025 accredited for crystalline silica** by an accreditation body meeting ISO/IEC 17011, use NIST-traceable standards, operate an internal QC program, and achieve a limit of detection no higher than 25% of the PEL based on the sample air volume. Sampling with an ISO 7708 respirable cyclone.

ESC's named laboratories and industrial hygienist. Sampling is designed and performed by ESC's industrial hygiene consultant, **EH&E — Environmental Health & Engineering, Inc., 180 Wells Avenue, Suite 200, Newton, MA 02459 — 781-247-4300 (toll-free 800-825-5343), contact@eheinc.com.** Analysis is placed with an **AIHA-LAP, LLC accredited industrial hygiene laboratory** holding ISO/IEC 17025 accreditation:

- **SGS Galson**, East Syracuse, NY — 888-432-5227 — **AIHA-LAP, LLC Lab ID 100324**, accredited in the IHLAP, ELLAP and EMLAP programs to ISO/IEC 17025, continuously since 1979. SGS Galson runs a dedicated silica program and loans sampling pumps and cyclones, which suits a contractor of ESC's size that does not own a pump/cyclone train.
- **EMSL Analytical, Inc. — Boston Laboratory**, 5 Constitution Way, Unit A, Woburn, MA 01801 — 781-933-8411 — **AIHA-LAP, LLC Lab ID 180179 (IHLAP)** — the local option.

AIHA-LAP accreditation is verifiable live by Lab ID at the AIHA accredited-laboratories directory (online.aihaaccreditedlabs.org). **AIHA scopes are granted per analyte. Before a single sample ships, ESC confirms with the laboratory that respirable crystalline silica, by the method ESC is using, is inside that laboratory's accredited Field of Testing, and records the confirmation on the chain of custody.** A sample sent to a lab that is accredited for something else is a wasted sample and a defective record.

Laboratory used on this project: _____ AIHA-LAP Lab ID: _____

Method (ID-142 / NMAM 7500 / 7602 / 7603): _____ Silica confirmed in accredited scope: □

Confirmed by: _____ Date: _____

1. **Notify employees within 5 working days** of completing an exposure assessment, individually in writing or by posting the results in an appropriate location accessible to affected employees (1926.1153(d)(2)(vi)). If any result is above the PEL, the written notification must describe the corrective action being taken.
2. **Permit observation of monitoring** by affected employees or their designated representatives, providing any required PPE to observers at no cost (1926.1153(d)(2)(vii)).
3. **Implement engineering and work-practice controls** to reduce exposure to or below the PEL, unless ESC can demonstrate that is not feasible; where such controls are not sufficient, reduce exposure to the lowest feasible level and **supplement with respiratory protection** (1926.1153(d)(3)).
4. **Provide at minimum APF 10 respirators to the operator and the laborer at the hole pending monitoring results.**

If ESC relies on **objective data** rather than sampling, the objective-data record must satisfy every content element of 1926.1153(j)(2)(ii) — see Section 2.3.11. Citing a study without building the full record does not satisfy the standard.

2.3.6 §(g)(1)(iii) — Housekeeping (29 CFR 1926.1153(f))

PROHIBITED — no exceptions without the Competent Person's documented infeasibility determination:

1. **No dry sweeping and no dry brushing** where the activity could contribute to employee exposure to respirable crystalline silica — 1926.1153(f)(1). This includes sweeping drill cuttings, rock dust, dried slurry or concrete dust off pavement, off the rig deck, off tooling, off pier caps or off vehicles.
2. **No compressed air** used to clean clothing or surfaces where the activity could contribute to silica exposure — 1926.1153(f)(2) — **unless** the compressed air is used together with a ventilation system that effectively captures the resulting dust cloud, **or** no alternative method is feasible. Specifically prohibited on ESC sites: blowing cuttings off the auger, the kelly or the tooling; blowing out drilled anchor holes; blowing off the rig, the deck or a vehicle; **blowing off a person's clothing.**

ESC recognizes that blowing down the auger and the tooling with rig air is common practice in foundation drilling. It is prohibited at ESC. It is a per-instance violation and it puts silica straight into the breathing zone of the man standing at the hole.

"Infeasible" means the alternative would not be effective, would cause damage, or would create a hazard — not that it is merely inconvenient. ESC bears the burden of demonstrating infeasibility, and OSHA expects such situations to be very rare. Any infeasibility determination must be made in writing by the Competent Person and approved by Derek Snow before the method is used.

REQUIRED METHODS:

- **Wet sweeping**, squeegeeing, or **HEPA-filtered vacuuming** for all cuttings, dust and residue.
- **Clean up saw and core slurry before it dries** — shovel it wet, or use a wet vacuum equipped with a HEPA filter. Dried slurry on pavement becomes an airborne silica source under foot and tire traffic.
- Wet down and remove drilling spoil from the working surface promptly. On an occupied or public site this is also a site-condition and public-exposure obligation to the owner and the general contractor.
- **Vacuum filters, dust-collection bags and disposable PPE are themselves a dust source.** Change them with care, do not clean them with compressed air, and dispose of them in **sealed, heavy-duty bags or sealed containers** to prevent release of dust. Where filters or PPE must be cleaned, a HEPA-filtered vacuum is the acceptable method.
- Employees will **never** clean their own clothing with compressed air. Where clothing is heavily contaminated, HEPA-vacuum it or change out of it.

2.3.7 §(g)(1)(iv) — Restricting access to work areas

Per 29 CFR 1926.1153(g)(1)(iv), this plan must describe the procedures used to restrict access to work areas to minimize the number of employees exposed and their level of exposure, **including exposures generated by other employers or sole proprietors.** ESC's procedures:

Protecting others from ESC's dust.

1. Jean Prinsloo will establish and maintain an **exclusion zone** around the drill rig, the open shaft, the auger spin-off arc and the spoil pile. The zone is marked with cones, barrier tape or barricades, moves with the work, and is supervised by the Competent Person. It coincides with the fully barricaded swing radius required by ANSI/ASSP A10.23 §12.18 and the restricted access zone of A10.23 §6.2.
2. Only employees **engaged in the task** may be inside the zone. Non-engaged ESC employees, other trades, delivery drivers, owner representatives and the public are excluded, and where they must be nearby they are positioned **upwind**.
3. Access is restricted whenever employees are engaged in a Table 1 task **requiring respirator use** — for example, a traffic-control or spotting employee not engaged in the task must be kept away from and upwind of an employee chipping for more than 4 hours.
4. Dusty tasks will be **scheduled** for periods of lowest public and occupant traffic, coordinated in advance and in writing with the general contractor and the facility owner.
5. Where ESC works in or beside an occupied or public facility — for example, an active parking lot serving a working building — ESC will obtain a written agreement with the general contractor and the owner covering lot closure, vehicle routing and pedestrian routing around the exclusion zone, and will raise it at the preconstruction meeting.

Protecting ESC's employees from other employers' dust.

1. If another employer or a self-employed person on the site conducts a task generating **clearly visible dust** near ESC's crew, the Competent Person will (a) move ESC's employees away and upwind, or (b) obtain control of the dust from the other employer, and (c) **escalate to the general contractor in writing.** ESC's Competent Person has stop-work authority for ESC's crew for this reason.
2. Escalation contact: **the general contractor's project manager**, recorded for each project on the counterparty block at Section 1.4.6. The GC's on-site superintendent is ESC's first call in the field; his name and mobile number are taken at the preconstruction meeting and posted at the rig alongside the emergency call-down list.

GC site superintendent: _____ Mobile: _____ Recorded at the preconstruction meeting on: _____

2.3.8 Competent Person (29 CFR 1926.1153(b), (g)(4))

ESC designates JEAN PRINSLOO (MA Construction Supervisor License CS-122896) as the Competent Person for respirable crystalline silica, per 1926.1153(g)(4). The standard defines a competent person as "an individual who is capable of identifying existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them," and who "must have the knowledge and ability necessary to fulfill the responsibilities set forth in paragraph (g)."

Authority. Jean Prinsloo is authorized in writing by ESC to **stop work immediately**, at any time, on any ESC operation, to correct a silica control deficiency, and to remove any employee from a dust exposure. No ESC manager, no general contractor and no owner may override that decision. He is empowered and expected to shut the rig down over a clogged nozzle.

Duty. He will make **frequent and regular inspections of job sites, materials and equipment** to implement this plan. ESC's standard is a documented inspection **every shift on which any silica task is performed**, using the Competent Person Silica Control Checklist at Appendix 2-A. The checklist covers, at minimum:

- Water supply present and adequate; nozzles working, unclogged, undamaged and correctly aimed
- Hoses and connections intact; no kinks or tight bends
- Shroud/hood intact and installed per the manufacturer's instructions
- Dust collector filter cleaned/changed per manufacturer instructions; collection bag not overfilled
- Enclosed cab (if relied on): door seals and gaskets good, positive pressure on, HVAC running, cab kept closed, interior free of settled dust, filter within its change interval
- **No visible dust** at any point of dust generation
- Spoil pile wet; slurry cleaned up before drying; no dry sweeping; no compressed air in use
- Exclusion zone established, marked and honored; non-engaged personnel out and upwind
- Silica task-duration log current; respirator triggers reviewed for the shift

The working copy of each completed checklist stays in the site job box for the duration of the project. Completed checklists are transmitted to the ESC office weekly and are retained in the project file at **Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109**, with a scanned copy in the project folder of ESC's electronic records. Records custodian: Derek Snow, Treasurer. "Frequent and regular inspections" is a documentation requirement in practice: if it is not written down, ESC cannot prove it happened.

Qualification. OSHA does not mandate a specific training curriculum for the silica competent person; the employer determines what is necessary. ESC bases Jean Prinsloo's designation on his **Massachusetts Construction Supervisor License CS-122896**; his OSHA construction outreach training; his silica competent-person training; and his direct operational knowledge of ESC's drill rig water systems, dust shrouds, collectors and hand tools.

ESC's training standard, which is a requirement and not an aspiration: OSHA 30-hour Construction for the Competent Person, and OSHA 10-hour Construction minimum for **every** ESC employee on site — the latter is not optional on this job, because **M.G.L. c. 30, § 39S** requires every employee at the worksite of a Massachusetts public building project estimated to cost more than $10,000 to have completed an OSHA-approved construction safety course of at least 10 hours **before beginning work**, with documentation furnished with the first certified payroll report for that employee, and an undocumented worker on such a site is subject to immediate removal. ESC's outreach training is obtained through the Region 1 OSHA Training Institute Education Center — **Keene State College OSHA Education Center, 1050 Perimeter Road, Suite 202, Manchester, NH 03103 — 1-800-449-6742, oshaed@keene.edu.** Cards and completion certificates are held in the ESC training matrix and furnished to the general contractor on request.

Jean Prinsloo — OSHA 30-hour Construction. Provider: _____ Completion date: _____ Card no.: _____

Jean Prinsloo — Silica competent-person training. Provider: _____ Completion date: _____

2.3.9 Medical surveillance (29 CFR 1926.1153(h))

Trigger. ESC will make medical surveillance available at no cost to the employee, and at a reasonable time and place, **for each employee who will be required under 1926.1153 to use a respirator for 30 or more days per year** (1926.1153(h)(1)(i)).

How ESC counts days. "Per year" means the upcoming 365 days. **If an employee is required to wear a respirator at any time during a day, that counts as one full day of respirator use.** Respirator use with a previous employer does not count. If unexpected circumstances push an employee past 30 days, ESC will make surveillance available as soon as that becomes apparent. ESC tracks respirator-days per employee on the silica task-duration log (Appendix 2-B).

Current determination. When ESC executes its work with Table 1 wet controls on the drill rig, wet walk-behind sawing, shrouded/vacuum rotary hammers, cab-plus-water on the hoe-ram, and keeps chipping and handheld sawing to **4 hours or less per shift**, **no employee is required to wear a respirator, the 30-day trigger is not met, and silica medical surveillance is not owed.** This is a legitimate, documented position — not an assumption. Jean Prinsloo will re-verify it each project.

Tripwire. If any employee is projected to be required to wear a respirator on **30 or more days in the next 365 days**, ESC will make the initial medical examination available **within 30 days of initial assignment**, unless the employee has received a qualifying examination within the last 3 years.

Initial examination contents (1926.1153(h)(2)):

- Medical and work history, with emphasis on past, present and anticipated exposure to silica, dust and other agents affecting the respiratory system; any history of respiratory system dysfunction (shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;
- Physical examination with special emphasis on the respiratory system;
- **Chest X-ray** — a single posteroanterior radiographic projection at full inspiration, film (14×17 to 16×17 inches) or digital, interpreted and classified according to the ILO International Classification of Radiographs of Pneumoconioses by a **NIOSH-certified B Reader**;
- **Pulmonary function test** — FVC, FEV1 and FEV1/FVC ratio, administered by a spirometry technician holding a current certificate from a NIOSH-approved spirometry course;
- **Testing for latent tuberculosis infection**;
- Any other test deemed appropriate by the PLHCP.

Periodic examinations (1926.1153(h)(3)): all of the above **except** latent TB testing, at least **every 3 years**, or more frequently if recommended by the PLHCP.

Information ESC provides to the PLHCP (1926.1153(h)(4)): a copy of 29 CFR 1926.1153; a description of the employee's former, current and anticipated duties as they relate to silica exposure; the employee's former, current and anticipated exposure levels; a description of any PPE used and the length of time used; and any employment-related medical examination records in ESC's control.

PLHCP's written medical report to the employee (1926.1153(h)(5)): within 30 days of the exam — results, any medical condition placing the employee at increased risk of material impairment, any recommended limitations on respirator use, any recommended limitations on silica exposure, and a statement that the employee should be examined by a specialist **if the chest X-ray is classified as 1/0 or higher** by the B Reader.

PLHCP's written medical opinion to ESC (1926.1153(h)(6)): within 30 days, and it **"shall contain only the following"** — (A) the date of the examination; (B) a statement that the examination has met the requirements of the section; and (C) any recommended limitations on the employee's use of respirators. **ESC will not receive, and will not ask for, any other medical information** unless the employee gives written authorization. ESC gives the employee a copy of the opinion within 30 days of receiving it.

Specialist examination (1926.1153(h)(7)): if the PLHCP recommends referral to a specialist, ESC will make it available at no cost within 30 days of receiving the recommendation.

PLHCP / occupational health clinic. ESC's occupational health provider is **OccuMed Occupational HealthWorks (OccuMed of New England), 5 Dan Road, Canton, MA 02021 — office 877-399-1698, clinic 781-664-2842, info@occumedne.com** (Mon–Fri 8:00 am – 5:00 pm). OccuMed provides, on one account, the four services this program depends on: chest X-ray, spirometry, audiometry, and quantitative respirator fit testing.

Two conditions ESC confirms in writing with the provider before enrolling any employee in silica medical surveillance, because 1926.1153(h)(2) will not accept the exam without them: (1) the chest X-ray is **interpreted and classified per the ILO International Classification of Radiographs of Pneumoconioses by a NIOSH-certified B Reader**; and (2) the spirometry is administered by a **technician holding a current certificate from a NIOSH-approved spirometry course**. If a provider cannot meet both, ESC places the surveillance with a provider that can. A chest X-ray read by anyone other than a B Reader does not satisfy the standard, and paying for one is paying for nothing.

Provider confirmed to supply a NIOSH-certified B Reader: □ Confirmed by: _____ Date: _____

Do not confuse this with the respirator medical evaluation. The 1910.134 medical evaluation described in Section 2.4 is a **different and much lower trigger**: it is required before an employee is fit tested or wears a respirator **even once**. That is the requirement that will bite ESC first, and it cannot be arranged on the morning of an overrun.

2.3.10 Communication of silica hazards and training (29 CFR 1926.1153(i))

Respirable crystalline silica is included in ESC's hazard communication program (Section 2.1) per 1926.1153(i)(1). ESC ensures employees have access to labels and safety data sheets for silica-containing materials, and are trained per 1910.1200 and 1926.1153(i)(2).

The four hazards ESC's training must address, per 1926.1153(i)(1):

1. **CANCER**
2. **LUNG EFFECTS** (including silicosis, chronic obstructive pulmonary disease, and increased susceptibility to tuberculosis)
3. **IMMUNE SYSTEM EFFECTS** (including autoimmune disease)
4. **KIDNEY EFFECTS**

A training program that mentions only "silicosis" does not comply.

The six topics each covered employee must be able to demonstrate knowledge and understanding of, per 1926.1153(i)(2)(i)(A)–(F):

- (A) The health hazards associated with exposure to respirable crystalline silica;
- (B) The specific tasks in the workplace that could result in exposure to respirable crystalline silica (ESC's task table, Section 2.3.2);
- (C) The specific measures ESC has implemented to protect employees, including engineering controls, work practices and respirators (Section 2.3.3);
- (D) The contents of 29 CFR 1926.1153;
- (E) **The identity of the competent person designated by ESC — Jean Prinsloo**;

- (F) The purpose and a description of the medical surveillance program required by paragraph (h) — including, where applicable, ESC's determination that the 30-day trigger is not currently met and why.

ESC will make a copy of 29 CFR 1926.1153 readily available at no cost to each covered employee (1926.1153(i)(2)(ii)). A printed copy of the standard, together with the SDSs for aggregate, cement and grout, is kept in the site job box.

Format may be classroom, toolbox talk, hands-on demonstration, video or written material, provided employees have an opportunity to ask questions. Knowledge may be demonstrated by discussion, oral quiz or written test. A **signed training roster** is retained — Date: _____ Trainer: _____ Attendees (signed roster attached): □

A laminated **Table 1 quick-reference card** (Appendix 2-D) is kept in the truck and on the rig.

2.3.11 Recordkeeping (29 CFR 1926.1153(j); 29 CFR 1910.1020)

Air monitoring records — where any monitoring is performed, the record must contain, per 1926.1153(j)(1)(ii): (A) the date of measurement for each sample taken; (B) the task monitored; (C) sampling and analytical methods used; (D) the number, duration and results of the samples taken; (E) the identity of the laboratory that performed the analysis; (F) the type of personal protective equipment, such as respirators, worn by the employees monitored; and (G) the name and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.

Objective data records — where ESC relies on objective data instead of monitoring, the record must contain, per 1926.1153(j)(2)(ii): (A) the crystalline silica-containing material in question; (B) the source of the objective data; (C) the testing protocol and results of testing; (D) a description of the process, task or activity on which the objective data were based; and (E) other data relevant to the process, task, activity, material or exposures on which the objective data were based. **All five elements are mandatory.**

Medical records — per 1926.1153(j)(3)(ii): (A) name; (B) a copy of the PLHCPs' and specialists' written medical opinions; and (C) a copy of the information ESC provided to the PLHCPs and specialists. **ESC will not collect Social Security numbers for silica medical records.** The current regulatory text at (j)(3)(ii)(A) requires only "Name"; older OSHA guidance documents that reference an SSN are out of date.

Retention, per 29 CFR 1910.1020: exposure records (air monitoring and objective data) — **at least 30 years**. Medical records — **duration of employment plus 30 years** (with the 1910.1020 exception for employees employed less than one year, whose records need not be retained after employment ends if they are provided to the employee on termination).

Current status: where ESC follows Table 1 across all tasks and no employee is required to wear a respirator, **ESC generates no silica exposure records and no silica medical records.** That is a correct outcome, not a gap. It does not relieve ESC of the written plan, the Competent Person, the housekeeping rules, the training or the hazard communication obligations, all of which apply regardless.

Records custodian: **Derek Snow, Treasurer.** Records are held in the project file at **Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109**, with a scanned copy in the project folder of ESC's electronic records. Medical records are held separately from personnel records and are released only as 1910.1020 permits.

2.3.12 Plan review, availability and enforcement context

- **Availability.** The written exposure control plan will be made **readily available for examination and copying, on request, to each covered employee, their designated representatives, the Assistant Secretary of Labor for OSHA and the Director of NIOSH** (1926.1153(g)(3)). A current copy is kept **on site**, in the job box, on every project where silica tasks occur.
- **Annual review.** ESC will review and evaluate the effectiveness of this plan **at least annually** and update it as necessary (1926.1153(g)(2)). Reviewer: Derek Snow, Treasurer. Last review: *not applicable — initial issue, July 14, 2026*. **Next review due: July 14, 2027.** Although the standard does not require documentation of the review, ESC documents it.
- **Enforcement posture.** OSHA's National Emphasis Program for Respirable Crystalline Silica (CPL 03-00-023, Feb. 4, 2020) directs each OSHA Region to devote at least 2% of inspections annually to respirable crystalline silica, and OSHA anticipates that the majority of those inspections will occur in construction. Foundation and site-preparation drilling falls within the NEP's construction targeting universe, and a visible drill rig in an open public parking lot is exactly the kind of operation that draws an inspection. **The first document a compliance officer will ask for is this plan.** It must exist, be on site, name the Competent Person, and match what the crew is actually doing.

2.4 Respiratory Protection Program (29 CFR 1910.134, adopted by 29 CFR 1926.103)

2.4.1 When respirators are required

Per 29 CFR 1926.1153(e)(1), respiratory protection is required:

- **(i) Where specified by Table 1** — for ESC, this means handheld sawing or chipping/breaking that exceeds 4 hours in a shift (outdoors), or any of those tasks performed indoors or in an enclosed area; and
- **(ii) For tasks not on Table 1, or where ESC does not fully and properly implement the Table 1 controls** — (A) where exposures exceed the PEL during periods necessary to install or implement feasible engineering and work-practice controls; (B) where exposures exceed the PEL during tasks for which such controls are not feasible; and (C) during tasks for which ESC has implemented all feasible engineering and work-practice controls and those controls are not sufficient to reduce exposures to or below the PEL.

Respirators may also be required for non-silica hazards (e.g., an SDS-driven requirement, or a confirmed atmospheric contaminant). Any such requirement is administered under this same program.

Respirators are the last line of defense and never a substitute for the engineering control. ESC's method is to engineer the dust out.

2.4.2 Written program and program administrator

Where respirator use is required, 29 CFR 1926.1153(e)(2) requires ESC to institute a respiratory protection program in accordance with **29 CFR 1910.134**. ESC maintains a written respiratory protection program covering worksite-specific procedures, per 1910.134(c)(1).

Program administrator: Jean Prinsloo, MA CS-122896, designated under 1910.134(c)(3). He administers the program and conducts the required evaluations of program effectiveness. The standard requires the administrator to be "qualified by appropriate training or experience that is commensurate with the complexity of the program" — for ESC that means training covering respirator selection and assigned protection factors, the medical evaluation pathway, fit testing, cleaning/storage/maintenance, cartridge and filter change schedules, and program evaluation. His training is recorded on the ESC training matrix and refreshed on the provider's stated interval.

Respiratory protection program administrator training. Provider: _____ Completion date: _____ Refresher due: _____

Per 1926.1153(e)(3), full and proper implementation of Table 1 is deemed compliance with the respirator-selection provisions of 1910.134(d)(1)(iii) and (d)(3). **It is not a waiver of anything else in 1910.134.** ESC must still comply with the written program, medical evaluation, fit testing, training, cleaning, storage, maintenance, cartridge change schedules and program evaluation requirements.

2.4.3 Respirator selection

Trigger	Assigned Protection Factor	ESC-issued respirator
Table 1 (ii) handheld saw, outdoors, >4 hr	APF 10	NIOSH-approved half-mask elastomeric with **P100** filters (preferred), or N95/P100 filtering facepiece
Table 1 (x) chipping/jackhammer, outdoors, >4 hr	APF 10	As above
Any Table 1 task indoors/enclosed, per the table	APF 10	As above
Paragraph (d) task pending exposure data (e.g., dry air-flush rock drilling)	APF 10 minimum, pending results	Half-mask elastomeric with P100 filters
Exposure demonstrated >10× PEL (not expected on ESC work)	APF above 10	Full-facepiece APR (**APF 50**) or a PAPR. The selection follows the measured number, not a guess: maximum use concentration = APF × PEL, so a half-mask (APF 10) covers to 500 µg/m³ and a full facepiece (APF 50) to 2,500 µg/m³. ESC will not upgrade above APF 10 on assumption, and will not stay at APF 10 if the data says otherwise.

- All respirators must be **NIOSH-certified** and used in compliance with the conditions of certification (1910.134(d)(1)(ii)).
- ESC's standard issue is a **half-mask elastomeric respirator with P100 particulate filters**, because it is cleanable, quantitatively fit-testable, and does not depend on the fit of a disposable.
- ESC selects respirators appropriate to the chemical state and physical form of the contaminant and to the workplace and user factors (1910.134(d)(1)(i)).
- **No respirator issued by ESC will be used in an IDLH atmosphere.** ESC does not perform work in IDLH atmospheres. ESC does not enter drilled shafts.

2.4.4 Medical evaluation (1910.134(e)) — the gating requirement

ESC will provide a medical evaluation to determine each employee's ability to use a respirator BEFORE the employee is fit tested and BEFORE the employee is required to use a respirator in the workplace (1910.134(e)(1)). This applies even to a single day's required use.

1. The evaluation is performed by a **physician or other licensed health care professional (PLHCP)** using the **OSHA respirator medical evaluation questionnaire in Appendix C to 1910.134**, or an initial medical examination that obtains the same information (1910.134(e)(2)).
2. The questionnaire is administered **confidentially**, during the employee's normal working hours or at a time and place convenient to the employee, in a manner that ensures the employee understands its content. The employee is given an opportunity to discuss the results with the PLHCP.

3. ESC provides the PLHCP with: the type and weight of the respirator; the duration and frequency of use; the expected physical work effort; additional protective clothing and equipment to be worn; and the temperature and humidity extremes that may be encountered (1910.134(e)(5)(i)).
4. ESC obtains a **written recommendation** from the PLHCP as to the employee's ability to use the respirator, including any limitations, the need for a follow-up evaluation, and a statement that the employee has been provided a copy of the recommendation (1910.134(e)(6)). **ESC receives only the fitness recommendation, not the employee's medical information.**
5. Additional medical evaluation is provided where: the employee reports medical signs or symptoms related to respirator use; the PLHCP, supervisor or program administrator recommends it; information from the program (including observations during fit testing and program evaluation) indicates a need; or a change in workplace conditions substantially increases the physiological burden on the employee (1910.134(e)(7)).

PLHCP. ESC uses either of two routes, both of which satisfy 1910.134(e)(2):

- **Clinic route — OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — office 877-399-1698, clinic 781-664-2842, info@occumedne.com.** ESC's standing occupational health provider; also performs the fit test, so the medical evaluation and the fit test can be done in one visit, in the correct order.
- **Questionnaire route — the 3M Online Respirator Medical Evaluation** (3M Center for Respiratory Protection). The Appendix C questionnaire is completed online, reviewed by a PLHCP, and a written clearance is returned. OSHA does not require an in-person examination; the questionnaire is sufficient unless the PLHCP calls for a follow-up examination (1910.134(e)(3)).

Operational consequence — read this. A medical evaluation, a fit test and training cannot be arranged on the morning that a chipping task overruns four hours. **ESC will therefore pre-qualify its field crew — medical evaluation, quantitative fit test and training on half-mask P100s — regardless of whether a respirator is currently required.** Pre-qualification is carried on the Respirator Medical Evaluation / Fit Test Roster (Appendix 2-F), one line per employee:

Employee: _____ Medical evaluation date: _____ PLHCP: _____

Cleared to wear a half-mask APR: □ Limitations recommended by the PLHCP: _____

2.4.5 Fit testing (1910.134(f))

1. Every employee required to use a **tight-fitting facepiece** respirator must be fit tested with the **same make, model, style and size** of respirator he will actually use, **before initial use, whenever a different respirator facepiece is used, and at least annually thereafter** (1910.134(f)(2)).
2. Fit testing is performed using an **OSHA-accepted QLFT or QNFT protocol** from Appendix A to 1910.134. **ESC's standard is quantitative fit testing (QNFT)** on the half-mask elastomeric it issues, performed by **OccuMed Occupational HealthWorks, Canton, MA — 877-399-1698**, which performs both QNFT and QLFT. A tight-fitting half facepiece passes QNFT at a **fit factor of 100 or greater**; a full facepiece at **500 or greater** (1910.134(f)(7)). Where a QNFT is not available, an OSHA-accepted QLFT protocol from Appendix A may be used, but only for a negative-pressure air-purifying respirator that must achieve a fit factor of 100 or less (1910.134(f)(6)) — which covers the half-mask ESC issues and does not cover anything above it. The employee must be **medically cleared before he is fit tested**: the sequence is medical evaluation → fit test → use, and it is never run backwards.

Employee: _____ Respirator make / model / size: _____

Protocol used (QNFT / QLFT): _____ Fit factor achieved: _____ Pass: □ Date: _____ Next due: _____

1. An additional fit test is conducted whenever the employee or the PLHCP, supervisor or program administrator reports or observes changes in the employee's physical condition that could affect fit — including facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight (1910.134(f)(3)).
2. **Facial hair rule (1910.134(g)(1)(i)):** ESC will not permit a tight-fitting respirator to be worn by an employee who has **facial hair that comes between the sealing surface of the facepiece and the face, or that interferes with valve function**, or any condition that interferes with the face-to-facepiece seal. Employees required to wear a tight-fitting respirator must be **clean-shaven at the sealing surface at the start of every shift.** This is not negotiable, and it must be communicated at hire.
3. Corrective glasses, goggles or other PPE must be worn in a manner that does not interfere with the seal (1910.134(g)(1)(ii)).
4. **User seal check.** Every employee performs a positive- and negative-pressure user seal check (or the manufacturer's recommended check) **each time** the respirator is put on, per Appendix B-1 to 1910.134.
5. Fit test records are retained until the next fit test is administered (1910.134(m)(2)).

2.4.6 Use, maintenance, care and cartridge change

1. **Continuing effectiveness.** The Competent Person will evaluate the respirator's continuing effectiveness whenever workplace conditions change or employee exposures increase (1910.134(g)(2)).
2. **Leave-to-maintain.** Employees are permitted to leave the respirator use area to wash their faces and respirator facepieces to prevent skin or eye irritation; to replace filters or cartridges; to change the respirator; or if they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece (1910.134(g)(2)(i)). **No employee will be disciplined or discouraged from leaving a dusty area to service a respirator.**
3. **Cleaning and disinfecting (1910.134(h)(1)):** respirators issued for the exclusive use of one employee are cleaned and disinfected **as often as necessary to be maintained in a sanitary condition**; respirators used by more than one employee are cleaned and disinfected **before being worn by different individuals**; respirators used in fit testing and training are cleaned and disinfected after each use. Procedures follow Appendix B-2 to 1910.134.
4. **Storage (1910.134(h)(2)):** respirators are stored to protect them from damage, contamination, dust, sunlight, extreme temperature, excessive moisture and damaging chemicals, and are packed or stored to prevent deformation of the facepiece and exhalation valve. **Respirators do not live loose in a gang box, a truck bed, or on the rig deck.** ESC issues each employee a sealed storage bag or case.
5. **Inspection (1910.134(h)(3)):** all respirators used in routine situations are inspected **before each use and during cleaning**, including a check of respirator function, tightness of connections, and the condition of the facepiece, head straps, valves, connecting tube and cartridges/filters, and a check of elastomeric parts for pliability and signs of deterioration.
6. **Repairs (1910.134(h)(4)):** respirators that fail inspection or are otherwise defective are **removed from service** and are discarded, repaired or adjusted. Repairs are made only by appropriately trained persons using NIOSH-approved parts designed for the respirator; no attempt is made to replace components or make modifications beyond the manufacturer's recommendations.
7. **Filter/cartridge change schedule.** ESC uses **P100 particulate filters** for silica. Particulate filters are changed: when breathing resistance becomes noticeably elevated; when the filter is damaged, wet, crushed or visibly loaded; when the employee cannot achieve a user seal check; at the end of any shift in which the filter has been heavily loaded; and in any event on the schedule the filter manufacturer publishes for that filter. **Read the service life and change interval from the filter manufacturer's instructions for the filter actually issued, post it inside the respirator storage case, and record each change on the respirator issue record.** A P100 is a mechanical filter: it does not "expire" from use in the way a chemical cartridge does, but a loaded filter raises breathing resistance until the employee starts to cheat the seal, and that is how a filter kills a fit test in the field.

Filter — manufacturer / model: _____ NIOSH approval (TC-) no.: _____

Manufacturer's stated change interval: _____ Date issued: _____ Date changed: _____

If any gas- or vapor-removing cartridge is ever required for another hazard, ESC will establish a written change schedule based on objective information or data per 1910.134(d)(3)(iii)(B)(2); **odor/taste/irritation warning properties will not be relied upon** as the change indicator unless a NIOSH-certified end-of-service-life indicator is used.

1. **Breathing air.** ESC does not use atmosphere-supplying respirators. If that ever changes, the requirements of 1910.134(i) (Grade D breathing air, cylinder testing, compressor requirements, CO alarms) apply and this program must be amended first.

2.4.7 Training (1910.134(k))

Each employee required to use a respirator is trained, **before requiring the employee to use a respirator in the workplace**, so that he can demonstrate knowledge of at least:

- (i) why the respirator is necessary and how improper fit, usage or maintenance can compromise its protective effect;
- (ii) the limitations and capabilities of the respirator;
- (iii) how to use the respirator effectively in emergency situations, including if it malfunctions;
- (iv) how to inspect, put on and remove, use, and check the seals of the respirator;
- (v) the procedures for maintenance and storage;
- (vi) how to recognize medical signs and symptoms that may limit or prevent effective respirator use; and
- (vii) the general requirements of 1910.134.

Training is repeated **annually**, and more often if workplace conditions change, if a new type of respirator is used, or if inadequacies in the employee's knowledge or use indicate that retraining is necessary (1910.134(k)(5)).

Training record — Date: _____ Trainer: _____ Signed roster attached: □

2.4.8 Voluntary use

Where an employee wishes to wear a filtering facepiece (dust mask) when a respirator is **not** required, ESC will provide the employee with the information in **Appendix D to 1910.134** (1910.134(c)(2)(i)). For voluntary use of any respirator other than a filtering facepiece, ESC must also provide the medical evaluation and ensure the respirator is cleaned, stored and maintained so that its use does not present a health hazard (1910.134(c)(2)(ii)). The same paragraph carries the express exception: "*Employers are not required to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering facepieces (dust masks).*" Those employees still receive the Appendix D information. **Voluntary use of a dust mask is not a substitute for an engineering control and does not excuse a failed water system.**

2.4.9 Program evaluation and records

ESC will conduct evaluations of the workplace as necessary to ensure the written program is being properly implemented, and will consult employees required to use respirators to assess their views on program effectiveness and to identify problems, including fit, selection, use and maintenance (1910.134(l)). Records: medical evaluation recommendations are retained per 1910.1020; fit-test records are retained until the next fit test; a written copy of the current program is retained (1910.134(m)).

2.5 Occupational Noise Exposure and Hearing Conservation (29 CFR 1926.52; 1926.101)

2.5.1 The hazard on ESC work

ESC's equipment is among the loudest in construction. Down-the-hole hammers, percussion drills, hydraulic breakers and hoe-rams, rock augers grinding in a socket, casing being driven or vibrated, air compressors, and concrete saws and chipping hammers all readily exceed 100 dBA at the operator's position. Noise-induced hearing loss is permanent, painless and cumulative. **ESC treats hearing protection as baseline PPE whenever this equipment is running.**

2.5.2 Permissible exposures (29 CFR 1926.52)

29 CFR 1926.52(a): "Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table D-2 of this section when measured on the A-scale of a standard sound level meter at slow response."

Table D-2 — Permissible noise exposures (29 CFR 1926.52):

Duration per day (hours)	Sound level (dBA, slow response)
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

- Per 1926.52(b), when employees are subjected to sound levels exceeding Table D-2, **feasible administrative or engineering controls shall be utilized first**. If such controls fail to reduce sound levels within the levels of the table, **personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.**
- Per 1926.52(d)(2)(i)–(ii), when the daily noise exposure is composed of two or more periods of noise exposure at different levels, the **combined effect must be considered** rather than the individual effect of each: the equivalent noise exposure factor **Fe = (T1/L1) + (T2/L2) + ... + (Tn/Ln)**, where T is the period of noise exposure at any essentially constant level and L is the duration of the permissible noise exposure at that constant level (from Table D-2). **If the value of Fe exceeds unity (1), the exposure exceeds permissible levels.**
- Per 1926.52(e), **exposure to impulsive or impact noise shall not exceed 140 dB peak sound pressure level.** Hydraulic breakers, hoe-rams, DTH hammers and casing driving are impact noise sources; ESC treats them as capable of exceeding 140 dB peak and protects accordingly.
- Per 1926.52(d)(1), in all cases where the sound levels exceed the values shown in Table D-2, **a continuing, effective hearing conservation program shall be administered.**

2.5.3 ESC hearing conservation program

1. Monitoring. ESC will determine noise exposure for employees operating or working adjacent to loud equipment.

- **Screening.** Area and task levels are screened with a **Type 2 or better sound level meter, A-weighted, slow response**, per 1926.52(a). The meter is **field-checked with an acoustic calibrator immediately before and immediately after each set of readings**; if the post-check has drifted, the readings are discarded and retaken. Read the calibration interval from the meter manufacturer's manual and keep the meter inside it.
- **Dosimetry.** Where an 8-hour TWA cannot be reasonably estimated from screening — which is the usual case on a rock-drilling shift, where the level swings between idling and percussion — ESC uses **personal noise dosimetry**. Dosimetry is performed on the **drill rig operator**, on the **laborer at the hole**, and on the **breaker/chipping operator** on a representative rock-drilling shift.
- **Provider.** Dosimetry and the interpretation of the results are performed by ESC's industrial hygiene consultant, **EH&E — Environmental Health & Engineering, Inc., 180 Wells Avenue, Suite 200, Newton, MA 02459 — 781-247-4300 (toll-free 800-825-5343)**. The same consultant performs ESC's silica sampling, so noise and silica are characterized on the same shift by the same firm.
- **Re-monitoring.** Repeated whenever a change in equipment, tooling or process may reasonably be expected to increase exposure — a new hammer, a new rig, a harder rock, a tighter site.

ESC will not fabricate or assume exposure data. Until ESC has data, it applies the conservative rule in item 2.

Sound level meter — make / model: _____ Type (2 or better): _____

Calibrator check passed before and after readings: □ Readings taken by: _____ Date: _____

Task / location: _____ Level (dBA, slow response): _____ Distance from source: _____

Dosimetry — employee: _____ Date: _____ 8-hr TWA: _____ dBA Dose: _____ %

2. Conservative default rule — mandatory today. Until measured data says otherwise, **hearing protection is REQUIRED for every employee within the work area whenever any of the following is operating:** the drill rig (drilling, coring, socketing or casing), a DTH or percussion hammer, a hydraulic breaker or hoe-ram, a concrete saw, a chipping hammer, a grinder, an air compressor, a concrete pump, a vibrator, or a generator. A practical field rule the crew will apply: **if you must raise your voice to be understood by someone an arm's length away, hearing protection is required.**

3. Hearing protectors (29 CFR 1926.101). Per 1926.101(a): "Wherever it is not feasible to reduce the noise levels or duration of exposures to those specified in Table D-2 ... ear protective devices shall be provided and used." Per 1926.101(b), ear protective devices inserted in the ear "shall be fitted or determined individually by competent persons," and per 1926.101(c), **"Plain cotton is not an acceptable protective device."**

ESC provides, at no cost, and specifies the protection by rating rather than by brand:

- Foam or flanged **earplugs with a Noise Reduction Rating (NRR) of at least 29**, in a range of sizes, individually fitted, with employees trained and observed on correct roll-down and insertion. An earplug that is not seated is not protection; it is jewelry.
- **Earmuffs with an NRR of at least 24**, compatible with the hard hat (cap-mounted or over-the-head), with the cushions intact and the headband tension not stretched out.
- **Dual protection — plugs AND muffs worn together — is REQUIRED**, not recommended, for operating or standing adjacent to a **DTH or percussion hammer**, a hydraulic breaker or hoe-ram, or during casing driving, and for any exposure estimated or measured **at or above 105 dBA**.
- **Plain cotton is not an acceptable protective device** (1926.101(c)). Neither are earbuds, music headphones, or a shirt collar.

ESC does not credit the full printed NRR. The laboratory rating is obtained under laboratory fit conditions; real-world attenuation is a fraction of it. That derating is precisely why dual protection is mandatory around percussion drilling rather than reliance on one high-NRR device, and why plugs are fitted individually under 1926.101(b) instead of thrown in a bucket by the gang box.

Hearing protectors are inspected before use, kept clean, and replaced when soiled, hardened, torn or compressed. Plugs are single-use unless they are a reusable flanged type, and reusable plugs are washed, not licked.

4. Engineering and administrative controls first (1926.52(b)). Before relying on PPE, ESC will: maintain mufflers and exhaust systems on all equipment; use properly sharpened/serviced tooling (dull tooling is louder and slower); keep the rig cab closed and sealed during drilling; use wet methods (which also reduce noise); locate compressors and generators away from the work face and behind acoustic barriers where practical; **rotate employees** off the highest-noise tasks to limit individual daily dose; and schedule the loudest operations to limit the number of employees exposed. Noise controls and silica controls reinforce each other — a closed, sealed cab serves both.

5. Audiometric testing. The OSHA construction trigger for a continuing, effective hearing conservation program is an **exceedance of Table D-2 (90 dBA / 8-hr TWA, 5-dB exchange) — 29 CFR 1926.52(d)(1)**. The **85 dBA action level, audiometric testing, STS calculation and 21-day notification requirements of 29 CFR 1910.95 apply to General Industry and are not incorporated into Part 1926.** ESC nevertheless adopts, **AS COMPANY POLICY** and as a more protective standard, the **NIOSH REL of 85 dBA as an 8-hour TWA**: where ESC monitoring shows exposure **at or above 85 dBA**, ESC will institute an audiometric testing program comprising a **baseline audiogram** within **6 months** of first exposure at or above that level, preceded by at least 14 hours without workplace noise exposure; **annual audiograms** thereafter; professional review of each audiogram; comparison of annual to baseline audiograms to identify a **standard threshold shift (STS)** — an average shift of 10 dB or more at 2000, 3000 and 4000 Hz in either ear; and, on a confirmed STS, employee notification in writing within 21 days, refitting and retraining in hearing protectors, and referral for clinical audiological evaluation where indicated.

Provider. Audiometric testing is performed by **OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — 877-399-1698, clinic 781-664-2842**, whose service menu includes audiograms, or by a mobile audiometric provider such as **Examinetics — 800-493-5377**, where a unit is brought to the crew. For a company of ESC's size the fixed clinic is the practical route; a mobile van is priced for a far larger headcount. Audiograms are conducted or reviewed by an audiologist, otolaryngologist or other physician, or by a technician certified by the Council for Accreditation in Occupational Hearing Conservation or equivalent, and are performed in a room meeting the background-noise requirements for audiometric testing.

Audiometric records are retained per 29 CFR 1910.1020 for the duration of employment plus 30 years.

Employee: _____ Baseline audiogram date: _____ 14 hours quiet before test: □

Annual audiogram date: _____ Reviewed by: _____ STS identified (Y/N): _____

If STS — employee notified in writing on: _____ Refitted and retrained on: _____

6. Training. Employees are trained annually on: the effects of noise on hearing; the purpose, advantages, disadvantages and attenuation of the various types of hearing protectors; the selection, fitting, use and care of hearing protectors; and the purpose and procedures of audiometric testing.

Training record — Date: _____ Trainer: _____ Signed roster attached: □

7. Site neighbors. Rock drilling and breaking are loud enough to disturb occupants of adjacent buildings. Where ESC works next to an occupied or public building, ESC will coordinate with the general contractor on **work-hour restrictions and advance notice to the occupant**. This is a coordination obligation, not a safety control, and it does not reduce the PPE requirement.

2.6 Heat Illness Prevention

There is no OSHA standard specific to heat as of the date of this document; heat is enforced under the **General Duty Clause, OSH Act Section 5(a)(1)**, and ESC treats heat illness as a recognized hazard requiring a written control program. 29 CFR 1926.51(a) independently requires ESC to provide **potable water** at the site.

2.6.1 Water, rest, shade — the mandatory baseline

1. **WATER.** Potable drinking water is provided at every ESC worksite (1926.51(a)(1)). Water must be cool, in an adequate quantity, and **located as close as practicable to the work area** — not 300 feet away at the gate. Portable containers must be capable of being tightly closed and equipped with a tap; water may not be dipped from the container (1926.51(a)(2)). **Common drinking cups are prohibited** (1926.51(a)(4)); ESC provides single-use cups and a marked receptacle for used cups (1926.51(a)(5)). Any container used to distribute drinking water must be clearly marked and must not be used for any other purpose (1926.51(a)(3)).

Rule: ESC plans for **one quart of water per employee per hour** in hot conditions. Employees will drink approximately **one cup (8 oz) every 15–20 minutes** — do not wait until thirsty. Alcohol is prohibited. Employees are cautioned that heavy caffeine and high-sugar energy drinks are not substitutes for water.

1. **REST.** Employees are permitted and encouraged to take **rest breaks as needed to prevent overheating**, without asking permission and without penalty. Jean Prinsloo will schedule mandatory breaks as conditions warrant. Rest break frequency increases with the heat index — see 2.6.2.
2. **SHADE.** ESC provides access to **shade** — a canopy, a tent, the shaded side of the equipment or truck, or an air-conditioned vehicle cab — sufficient to accommodate the crew on break, located as close as practicable to the work area. Shade must be available at all times when employees may be exposed to heat, not only after someone feels ill. **A hot pickup truck cab with the windows up is not shade.**

2.6.2 Heat index action levels

Jean Prinsloo will check the forecast heat index each morning (NOAA forecast and the **OSHA-NIOSH Heat Safety Tool** app) and will apply the following escalating controls.

Heat index	ESC actions
Below 80°F	Baseline: water, rest, shade available. Encourage hydration.
80°F – 91°F (Caution)	Water within easy reach. Remind crew to drink. Acclimatize new and returning employees (2.6.3). Toolbox talk on heat symptoms.
91°F – 103°F (Moderate risk)	Actively encourage drinking every 15 minutes. **Scheduled rest breaks in shade.** Buddy system — employees watch each other for symptoms. Move the most strenuous work (chipping, breaking, cage handling, concrete placement) to the coolest hours. Adjust the work/rest ratio.
103°F – 115°F (High risk)	**Mandatory work/rest cycles**, break frequency and duration set by the Competent Person. Consider **stopping non-essential strenuous work**. Continuous monitoring of employees by a person trained to spot heat illness symptoms. **No employee works alone.** Re-sequence to start the shift earlier.
Above 115°F (Very high / extreme)	**Reschedule or stop the work.** Only essential work proceeds, under continuous supervision, with maximum controls.

Employees working in **enclosed rig cabs without functioning air conditioning**, or wearing a respirator, hi-vis, or impermeable clothing, experience a **higher effective heat stress than the ambient heat index shows.** The Competent Person will apply the next-higher risk tier for such employees.

2.6.3 Acclimatization

New employees, employees returning from more than a week away, and the entire crew during the first heat wave of the season are at the highest risk. A large share of heat fatalities occur in the first days on the job.

ESC's acclimatization schedule for a new or returning employee, and for the whole crew during a sudden heat wave:

- **Day 1:** no more than **20%** of the normal duration of work in the heat.
- **Day 2:** no more than **40%**.
- **Day 3:** no more than **60%**.
- **Day 4:** no more than **80%**.
- **Day 5 and after:** full duration.

Acclimatization is a supervisory duty, not an employee option. Jean Prinsloo will assign new employees to lighter, cooler tasks during their first week in hot weather and will say so out loud at the morning briefing.

2.6.4 Recognition and response

Condition	Signs	Response
Heat rash	Red cluster of pimples/blisters, usually neck, chest, groin	Move to a cooler, less humid place; keep the area dry
Heat cramps	Muscle spasms, pain, usually abdomen/arms/legs	Stop activity; move to shade; drink water or an electrolyte drink; do not return to strenuous work for several hours; seek medical care if cramps last more than 1 hour
Heat exhaustion	Heavy sweating, cold/pale/clammy skin, fast weak pulse, nausea/vomiting, headache, dizziness, weakness	Move to shade or A/C immediately; loosen clothing; cool with wet cloths or a cool bath; sip water; **stay with the employee**; **call 911 if vomiting, symptoms worsen, or symptoms last longer than 1 hour**
HEAT STROKE — MEDICAL EMERGENCY	Body temperature ≥103°F; **hot, red, dry OR damp skin**; **confusion, slurred speech, altered mental status**; fast strong pulse; seizure; loss of consciousness	**CALL 911 IMMEDIATELY.** Move the employee to a cool place. **Begin aggressive cooling at once — do not wait for EMS.** Immerse in cold water if possible, or apply ice/cold wet cloths to the head, neck, armpits and groin, and fan. **Do NOT give fluids to an unconscious or confused person.** Stay with the employee until EMS arrives.

Any confusion, slurred speech, staggering or unusual behavior in the heat is treated as heat stroke until proven otherwise. Call 911. Do not put the employee in a truck and "watch him."

Employees must report their own symptoms and their coworkers' symptoms immediately. **No employee will be disciplined for stopping work due to heat symptoms.** Employees are trained annually on heat illness. Training record — Date: _____ Trainer: _____ Signed roster attached: □

2.7 Cold Stress Prevention

ESC works in New England through the winter. Cold stress is enforced under the General Duty Clause, OSH Act Section 5(a)(1).

2.7.1 Controls

1. Jean Prinsloo will check the **temperature and wind chill** each morning. **Wind chill, not the thermometer, governs.**
2. **Warming area.** ESC provides a heated break area — a heated trailer, a truck cab with the heater running, or a heated tent — and **scheduled warm-up breaks**. Break frequency increases as wind chill falls.
3. **Clothing.** Layers, not bulk: an inner wicking layer, an insulating middle layer, and a wind/water-resistant outer layer. Insulated, waterproof boots. Insulated gloves suitable for the task. A hard-hat liner covering the ears. **Wet clothing must be changed immediately** — ESC will keep spare dry gloves, socks and liners on site.
4. **Buddy system** in cold conditions. Employees monitor each other; the early signs of hypothermia are behavioral and the affected person is the last to recognize them.
5. Warm, sweet, non-alcoholic drinks are provided. Alcohol is prohibited. Employees are advised that alcohol, nicotine and some medications increase cold injury risk.
6. **Contact hazards.** Steel casing, tooling, rebar cages and rigging in freezing weather can cause contact frostbite on bare skin. Gloves are mandatory. Do not touch cold metal with bare or wet hands.
7. **Winter silica and dust controls.** Water lines and dust-suppression systems freeze. ESC will drain lines, use heated totes, or add an environmentally acceptable antifreeze additive. **If the water system freezes, the Table 1 wet control has failed and the task stops until it is restored.** The crew will not switch to dry drilling or dry cutting "just for a minute."

8. **Slip hazards.** Ice on the rig deck, ladders, mats, casing and pavement. Sand or de-ice walkways and access points; clean ice off rig steps and platforms before use.

2.7.2 Recognition and response

Condition	Signs	Response
Hypothermia (mild)	Uncontrollable shivering, fatigue, confusion, loss of coordination, fumbling hands, slurred speech	Move to a warm place; **remove wet clothing**; warm the center of the body first (chest, neck, head, groin) with dry layers or blankets; warm sweet drinks if alert; monitor continuously
Hypothermia (severe) — EMERGENCY	**Shivering STOPS**; blue skin; dilated pupils; slow pulse and breathing; loss of consciousness	**CALL 911.** Move to a warm place, remove wet clothing, wrap in dry blankets including head and neck. Handle gently. **Do not give fluids to an unconscious person.** Give CPR if there is no pulse and no breathing.
Frostbite	Numbness; reddened skin developing gray/white patches; tingling, aching; firm or waxy skin; blisters in severe cases	Move to a warm area. **Do NOT rub or massage the area. Do NOT use direct heat, a heat lamp, a stove or a hot water bottle. Do NOT break blisters.** Loosely cover the area; do not walk on frostbitten feet. **Seek medical attention.** Do not rewarm if refreezing is possible.
Trench foot / immersion foot	Reddening skin, tingling, pain, swelling, leg cramps, numbness, blisters — from prolonged wet and cold, even above freezing	Remove wet shoes and socks; dry the feet; avoid walking on them; seek medical attention

Shivering that stops is not a good sign. It is a medical emergency. Call 911.

Employees are trained annually on cold stress. Training record — Date: _____ Trainer: _____ Signed roster attached: □

2.8 Hand-Arm Vibration (HAV) and Whole-Body Vibration

There is no OSHA standard establishing a numerical vibration exposure limit; hand-arm vibration syndrome (HAVS) — including vibration white finger, permanent numbness, loss of grip strength and loss of manual dexterity — is a recognized hazard addressed under the General Duty Clause and controlled by ESC as follows. The ACGIH TLV for hand-arm vibration is used as ESC's reference guideline.

2.8.1 ESC's vibrating tools

Chipping and demolition hammers; rotary hammers; handheld and cut-off saws; grinders; concrete vibrators; jackhammers; impact wrenches; tamper/compactor plates. **Chipping and breaking pier tops is ESC's highest hand-arm vibration exposure.** Whole-body vibration is a lesser but real exposure for drill rig, excavator and loader operators, particularly with a worn seat.

2.8.2 Controls (in order)

1. **Eliminate/substitute.** Choose the method with the lowest vibration that will do the job: a wet walk-behind saw instead of a handheld saw; a rig-mounted or stand-mounted drill instead of a handheld hammer; hydraulic breaking of the pier top by machine instead of by hand where geometry permits; correct cut-off elevation control during drilling and concreting so that **less hand chipping is needed in the first place.** Getting the concrete cut-off right is a vibration control.
2. **Select low-vibration tools.** ESC will prefer tools with published low vibration-emission values and with **anti-vibration handles or isolated grips**. Every powered hand tool ESC buys or rents is selected against the **declared vibration emission value ($a_h v_h$, in m/s²)** that the manufacturer publishes in the tool's operator's manual and declaration of conformity, measured to ISO 5349 / EN ISO 28927. **Read the declared value out of the operator's manual for the tool actually issued, compare it against the alternatives before the tool is bought or rented, and record it on the tool register below.** Where two tools will do the job, the lower declared value wins. A tool whose manufacturer publishes no declared emission value is not selected in preference to one that does.

Tool (make / model): _____ Declared vibration emission value (m/s²): _____

Value read from: operator's manual □ declaration of conformity □ Recorded by: _____ Date: _____

Continuous trigger-time limit set for this tool by the Competent Person: _____ minutes per employee per shift

1. **Maintain tools.** A dull chisel, a worn bit, a dull saw blade or an unbalanced grinding wheel dramatically increases vibration and forces the operator to push harder. **Sharp tooling is a vibration control.** Tools are inspected and serviced per the manufacturer's schedule; damaged anti-vibration mounts are replaced.
2. **Limit trigger time.** Jean Prinsloo will **rotate employees** through vibrating-tool tasks and limit continuous trigger time. This dovetails with the silica 4-hour rule (Section 2.3.4) — the same rotation that keeps silica exposure under 4 hours also cuts vibration dose.
3. **Grip and posture.** Employees will use the **minimum grip force** needed to control the tool safely, let the tool do the work, and avoid pushing or leaning on it. Support the tool weight with a stand, a spring balancer or the machine wherever possible.
4. **Keep hands warm and dry.** Cold and vibration together sharply increase the risk of vascular damage. Gloves, warm-up breaks and a heated area are HAV controls, not just cold-stress controls. Employees will avoid tobacco, which further constricts the blood vessels.
5. **Anti-vibration gloves.** ESC provides them, and employees are told the truth about them: they help with grip and warmth, they are **not a substitute for a low-vibration tool, tool maintenance, or limiting trigger time**, and they can even worsen exposure if they force a tighter grip.
6. **Whole-body vibration.** Equipment seats must be in serviceable condition with functioning suspension; a worn or bottomed-out seat is a defect and will be reported and repaired. Operators will adjust the seat to their weight, keep the working platform graded and free of ruts, and drive at speeds appropriate to the ground. Operators will not travel at speed over curbs, ruts or debris.

2.8.3 Health surveillance and reporting

Employees must **report immediately** any of the following: tingling or numbness in the fingers that persists after work stops; fingers that turn **white or blue in the cold** and then red and painful on rewarming; loss of grip strength; loss of feeling or dexterity (dropping small parts, trouble with buttons). These are the early signs of HAVS. **HAVS is permanent. Early reporting and reassignment is the only effective response.**

Any employee reporting these symptoms will be referred to ESC's occupational health provider — **OccuMed Occupational HealthWorks (OccuMed of New England), 5 Dan Road, Canton, MA 02021 — office 877-399-1698, clinic 781-664-2842, info@occumedne.com** — at ESC's expense, and will be **reassigned away from vibrating tools pending evaluation**, not merely told to be careful. The same provider carries ESC's respirator medical evaluations, audiograms and silica surveillance (Sections 2.3.9, 2.4.4 and 2.5.3), so the employee's occupational health history sits on one account. No employee will be penalized for reporting symptoms.

Employee: _____ Symptom reported: _____ Date reported: _____

Referred to provider on: _____ Reassigned off vibrating tools on: _____ By: _____

Employees are trained on HAV and HAVS symptoms at hire and annually. Training record — Date: _____ Trainer: _____ Signed roster attached: □

2.9 Contaminated Soil and Unknown Spoils Awareness

ESC drills, excavates and hauls spoil on urban, industrial, municipal and redevelopment sites. **ESC's crews may encounter contaminated soil, and they must be trained to recognize it and to stop.** ESC does **not** perform hazardous waste site work and does **not** hold HAZWOPER-certified crews unless separately stated.

2.9.1 Regulatory framework

- **29 CFR 1926.65** — Hazardous waste operations and emergency response (HAZWOPER). Applies to clean-up operations at uncontrolled hazardous waste sites, corrective actions at RCRA sites, and emergency response to releases of hazardous substances. **ESC's scope of work is not HAZWOPER work.** If a project is designated a HAZWOPER site, or if ESC's work becomes clean-up work at a site where hazardous substances are present, ESC will not proceed until the applicable HAZWOPER requirements — including site characterization, a site-specific health and safety plan, air monitoring, and the required 40-hour/24-hour training and medical surveillance — are met by qualified personnel, and until ESC has a written scope and a site-specific plan. **ESC states this plainly rather than hedging it: ESC holds no HAZWOPER 40-hour or 24-hour certifications, employs no HAZWOPER-trained personnel, and does not self-perform HAZWOPER work.** Where such work is required on a site ESC is on, it is performed by a HAZWOPER-qualified contractor engaged by the owner or the general contractor; ESC's crew stands down and returns to its own scope only after the general contractor confirms **in writing** that the area is released. If ESC is ever asked to price work of that character, it is bid separately, with the HAZWOPER-qualified subcontractor named on ESC's bid, and it is never inside ESC's base scope.
- **29 CFR 1926.55** — Gases, vapors, fumes, dusts and mists. Exposures must be avoided or controlled to the limits in Appendix A, by feasible administrative or engineering controls first, with respirators only where such controls are not feasible.
- **29 CFR 1926.651(g)** — Excavations: hazardous atmospheres. Where an oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist — **including where a hazardous atmosphere could reasonably be expected from a landfill, a nearby hazardous substance storage area, or contaminated soil — the atmosphere in an excavation deeper than 4 feet must be tested before employees enter**, and adequate precautions must be taken to prevent employee exposure to atmospheres containing less than 19.5% oxygen and other hazardous atmospheres; flammable gas must be kept below 20% of the lower flammable limit. Emergency rescue equipment — breathing apparatus, a safety harness and line, or a basket stretcher — must be readily available where a hazardous atmosphere exists or may reasonably be expected to develop, and must be attended when in use (1926.651(g)(2)).
- **Massachusetts:** contaminated soil and oil/hazardous material releases are regulated under the **Massachusetts Contingency Plan, 310 CMR 40.0000**, administered by MassDEP. **A release or a sudden discovery of contamination may trigger a reporting obligation with a short deadline.** ESC is not the reporting party in most cases — the site owner or the Licensed Site Professional is — but **ESC must notify the general contractor and the owner immediately** so that the obligation can be met — a reporting clock ESC cannot see is still running.

ESC obtains the name, firm and 24-hour number of the site's Licensed Site Professional (LSP) or environmental consultant of record at the preconstruction meeting, records them below, and posts them on the site emergency call-down list at the rig. Where the owner has not retained one, ESC records that fact in writing and the notification chain runs to the general contractor and the owner instead, per the counterparty block at Section 1.4.6.

LSP / environmental consultant of record: _____ Firm: _____

24-hour phone: _____ Obtained at the preconstruction meeting on: _____ By: _____

No LSP or environmental consultant retained by the owner for this site — notification runs to the GC and owner: □

2.9.2 Pre-mobilization due diligence

Before mobilizing to any site, ESC will request from the general contractor and the owner, in writing:

1. The **geotechnical report** and any **environmental site assessment (Phase I / Phase II)**, soil analytical data, or Release Abatement Measure / MCP documentation for the property;
2. The site history — prior industrial use, prior fuel storage, prior fill, prior landfill, prior dry cleaner, prior auto/fleet use, prior utility or transformer installation;
3. The **known or suspected presence of underground storage tanks, buried drums, urban fill, coal ash, asbestos-containing materials, PCB-containing equipment, or contaminated groundwater**;
4. The **spoil disposal plan and characterization** — where spoil goes, who characterizes it, and who pays if it is contaminated;
5. Confirmation of the locations of **all utilities, above and below grade** (also required by ANSI/ASSP A10.23 §4.1).

If the owner or GC will not provide this information, ESC will note the omission in writing before starting work. **ESC bids clean spoil. Contaminated spoil is a changed condition and is not in ESC's base price unless expressly stated.**

2.9.3 Field recognition — STOP indicators

Every ESC employee is trained to recognize the following in drill cuttings, spoil, casing returns and groundwater, and to **STOP WORK IMMEDIATELY and notify Jean Prinsloo**:

- **Odor** — petroleum, diesel, gasoline, solvent, sewage, sulfur/rotten egg, sweet chemical smell, or any strong unidentified odor
- **Staining or discoloration** — black, gray-green, purple, orange, blue, or any unnatural color in the soil
- **Sheen** — an oily or rainbow sheen on groundwater, on casing returns, in the shaft, or on the spoil
- **Debris and buried materials** — drums, tanks, piping, cinder/ash/slag, brick and demolition fill, wire, batteries, tires, medical or laboratory waste
- **Suspect materials** — friable fibrous material (possible asbestos), transformer or capacitor casings (possible PCBs), unlabeled containers
- **Physical symptoms** — headache, dizziness, nausea, eye/throat/nose irritation, unusual taste, in any employee near the excavation
- **Any change from what the geotechnical report described**

2.9.4 Stop-work and response procedure

1. **STOP the work.** Shut down the rig. Any employee has the authority to stop work on this basis. No employee will be penalized for doing so.
2. **Withdraw** all personnel upwind and uphill of the spoil, the shaft and the excavation. Establish an exclusion zone.
3. **Do not touch, sample, open, move or attempt to identify the material.** Do not spread it. Do not load it out. Do not backfill over it.
4. **Notify Jean Prinsloo immediately.** He will notify the general contractor and Derek Snow.
5. ESC will **not resume work** in the affected area until:
    - the material has been evaluated by a qualified party — the owner's environmental consultant, a Licensed Site Professional, or an industrial hygienist;
    - written direction has been received on how the material is to be handled, stockpiled, characterized and disposed of;
    - any required air monitoring has been performed and the controls, PPE and respiratory protection required for the actual hazard have been defined **in writing**; and
    - the general contractor has issued a written direction and, where the work is outside ESC's scope, a **change order**.
6. **Air monitoring.** Where a hazardous atmosphere is suspected in or around an excavation, ESC will test the atmosphere per 1926.651(g)(1) using a calibrated **4-gas meter (oxygen, LEL, CO, H_2S)** and, where organic vapors are suspected, a **PID**. **The meter is bump-tested against span gas before each day's use, and is calibrated on the interval the meter manufacturer publishes in its manual — read that interval out of the manual for the meter actually issued and mark it on the meter case.** A meter that fails a bump test, or that is outside its calibration interval, is **out of service**: the excavation is not entered and no atmosphere is certified on a meter ESC cannot trust. The bump-test log travels with the meter in the site job box; the current calibration certificate is held in the project file at **Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109**, with a scanned copy in ESC's electronic project folder. Records custodian: Derek Snow, Treasurer. **ESC does not enter drilled shafts under any circumstances**, so shaft-entry atmospheric testing is not applicable; testing applies to open excavations, trenches, and pits ESC's employees enter or work at the edge of, and to the breathing zone at the collar.

4-gas meter (O_2 / LEL / CO / H_2S) — make / model: _____ Serial no.: _____

Last calibration: _____ Manufacturer's calibration interval: _____ Next calibration due: _____

Bump test passed this shift: □ Bump-tested by: _____ Date / time: _____

PID (where organic vapors are suspected) — make / model: _____ Serial no.: _____ Response check passed: □

Readings at the excavation — O_2: _____ % LEL: _____ % CO: _____ ppm H_2S: _____ ppm VOC (PID): _____ ppm

Taken by: _____ Date / time: _____

Entry permitted — oxygen **at or above 19.5%**, flammable gas **below 20% of the lower flammable limit**, and no other hazardous atmosphere present (1926.651(g)(1)): □

1. **Decontamination.** Where employees or equipment have contacted suspected contaminated soil: remove and bag contaminated clothing and boots on site (do not wear them home or into a vehicle); wash exposed skin with soap and water; decontaminate tooling, tracks and tires before leaving the area so contamination is not tracked off site. ESC will provide a wash station and disposable coveralls where this is foreseeable.
2. **Documentation.** Jean Prinsloo will photograph and log the condition, the time, the location, the depth, and who was present, and will transmit it to the general contractor in writing the same day.

2.9.5 Training

All ESC field employees receive awareness-level training on the contents of this Section 2.9 at hire and annually: how to recognize the STOP indicators; the stop-work authority; the notification chain; and the fact that **ESC employees are not qualified to assess, sample or handle hazardous materials.**

Training record — Date: _____ Trainer: _____ Signed roster attached: □

2.10 Responsibilities, Review and Records for Part 2

Item	Owner	Frequency
Written Hazard Communication program and chemical inventory	Derek Snow / Jean Prinsloo	Reviewed annually and on introduction of any new chemical
SDS binder currency and on-site availability	Jean Prinsloo	Every mobilization
Written PPE hazard assessment	Jean Prinsloo	Each project; each new task
Silica written exposure control plan (Section 2.3)	**Derek Snow (owner) / Jean Prinsloo (CP)**	**Reviewed and evaluated for effectiveness at least ANNUALLY per 1926.1153(g)(2); on site at all times**
Competent Person silica control checklist (App. 2-A)	Jean Prinsloo	**Every shift on which a silica task is performed**
Silica task-duration / respirator-day log (App. 2-B)	Jean Prinsloo	**Daily, per employee**
Respiratory protection program; medical evaluations; fit tests	Jean Prinsloo	Fit test annually; medical evaluation before first use and as triggered
Noise monitoring / dosimetry — EH&E, Newton, MA (781-247-4300)	Jean Prinsloo	Baseline dosimetry on the first rock-drilling shift of each project (rig operator, laborer at the hole, breaker operator), then on any change of equipment, tooling or process. Baseline dosimetry performed on: _____

Item	Owner	Frequency
Audiometric testing (where the 85 dBA action level is exceeded) — OccuMed Occupational HealthWorks, Canton, MA (877-399-1698); mobile alternative Examinetics (800-493-5377)	Jean Prinsloo	Baseline within 6 months of first exposure at or above the action level, then annual
Heat and cold stress toolbox talks	Jean Prinsloo	Seasonally and as conditions warrant
Employee training rosters (all of Part 2)	Derek Snow	Retained per 1910.1020
Exposure records (air monitoring, objective data)	Derek Snow	**30 years** per 1910.1020
Medical records	Derek Snow	**Employment + 30 years** per 1910.1020

Written authorization. Jean Prinsloo, MA CS-122896, is designated the Competent Person for respirable crystalline silica under 29 CFR 1926.1153(g)(4) and is the ESC Site Safety Supervisor. **He is authorized by Earth Support Corp. to stop any ESC operation, at any time, without seeking approval, to correct a health hazard addressed in this Part.**

Approved:

Derek Snow, Treasurer, Earth Support Corp.

Signature: _____ Date: _____

Acknowledged (Competent Person):

Jean Prinsloo, MA CS-122896

Signature: _____ Date: _____

Appendices to Part 2

- **Appendix 2-A** — Competent Person Daily/Shift Silica Control Checklist
- **Appendix 2-B** — Silica Task Duration and Respirator-Day Log (per employee, per shift)
- **Appendix 2-C** — PPE Hazard Assessment Form (per project / per task)
- **Appendix 2-D** — Table 1 Silica Quick-Reference Card (laminated; truck and rig)
- **Appendix 2-E** — Chemical Inventory and SDS Index
- **Appendix 2-F** — Respirator Medical Evaluation / Fit Test Roster
- **Appendix 2-G** — Project-Specific Silica Addendum (one per project)

PART 3 — DRILLED SHAFT & FOUNDATION DRILLING OPERATIONS

3.0 Purpose, Scope and Applicable Standards

3.0.1 Purpose. This Part governs every drilled-shaft (caisson / drilled-pier) and foundation-drilling operation self-performed by Earth Support Corp. ("ESC"). It is the operational heart of ESC's Safety & Health Program. It applies to all ESC employees, to any ESC-hired operated-equipment rental, and to any lower-tier subcontractor working under ESC's direction on ESC's drilling operations.

3.0.2 Scope of work covered. Mobilization and demobilization; equipment offload; drill rig transport, walking/tracking and setup; overhead power line and underground utility protection; rotary drilling, augering, rock coring and socketing; casing installation and extraction; shaft cleanout; reinforcing cage handling; concrete and tremie placement; open-shaft protection; spoil management; and site restoration.

3.0.3 Applicable standards. ESC's drilling operations are governed by, and this Part is written against:

Subject	Authority
General safety and health provisions; competent person inspections	29 CFR 1926.20(b)(2); 29 CFR 1926.21(b)(2)
Excavations (a drilled shaft is an excavation)	29 CFR 1926 Subpart P (1926.650–.652)
Fall protection — holes, wells, pits, shafts	29 CFR 1926.501(b)(4); 1926.501(b)(7)(ii); 1926.502(b) and (i)
Respirable crystalline silica	29 CFR 1926.1153 (see **Part 2, Section 2.3 — Written Silica Exposure Control Plan**)
Occupational noise	29 CFR 1926.52; 1926.101
Mechanized equipment; clearance from energized lines	29 CFR 1926.600(a)(6)
Electrical — work near power circuits	29 CFR 1926.416(a)(1) and (a)(3)
Cranes and derricks in construction	29 CFR 1926 Subpart CC (1926.1400–.1442) — **note the dedicated-drilling-rig exclusion at 1926.1400(c)(11), discussed at §3.4.1**
Material handling, rigging, slings	29 CFR 1926 Subpart H; 29 CFR 1926.251
Concrete and masonry construction	29 CFR 1926 Subpart Q (1926.700–.706)
Confined spaces in construction (and its exclusion for excavations)	29 CFR 1926.1201(b)(1); 1926.1202
General Duty Clause	OSH Act § 5(a)(1)
Industry consensus standard — **ESC formally adopts this standard**	**ANSI/ASSP A10.23-2019**, *Safety Requirements for the Installation of Drilled Shafts* (current edition; the licensed copy is obtained from ASSP and kept in the ESC site file and on the rig)
Massachusetts underground facility damage prevention ("Dig Safe")	M.G.L. c. 82 §§ 40–40E; 220 CMR 99.00
Massachusetts overhead high-voltage lines	M.G.L. c. 166 §§ 21A–21G

3.0.4 Jurisdiction. Massachusetts has no State Plan covering private-sector construction. **Federal OSHA (29 CFR 1926) applies to all ESC work in Massachusetts.** Massachusetts state statutes cited above apply independently of OSHA and are separately enforceable. Where two rules differ, **ESC complies with the more protective rule.**

3.0.5 Voluntary adoption of ANSI/ASSP A10.23. ESC voluntarily adopts ANSI/ASSP A10.23 as its governing consensus standard for drilled-shaft installation. ESC does this knowingly: OSHA uses industry consensus standards to establish that a hazard is "recognized" under § 5(a)(1), and ESC intends to meet — not merely argue about — the standard its own industry wrote. Where this Part is stricter than A10.23 (most notably ESC's absolute no-man-entry rule at §3.10), **ESC's stricter rule governs.**

How this Part cites A10.23. A10.23 is a copyrighted, purchasable consensus standard. **This Part cites A10.23 by clause number only where ESC has confirmed the clause and its wording against the licensed copy — namely §§12.11, 12.12, 12.13, 12.19 and 12.20 (auxiliary-winch limits, multi-part blocking, auxiliary hoists on mobile cranes, operator qualification and authorization, and certification of crane-mounted drill-attachment operators).** Every other requirement in this Part is stated on its OSHA authority, on the Massachusetts statute, on the equipment manufacturer's manual, or as **ESC company policy** — and is enforced on that basis. ESC does not attribute a rule to a consensus standard it has not verified line-for-line. Nothing in this practice weakens a single requirement below: each one is binding on ESC's crew exactly as written.

3.0.6 Competent Person. The Competent Person for all ESC drilled-shaft operations is **Jean Prinsloo** (Massachusetts Construction Supervisor License CS-122896), support@earthsupportcorp.com. He is authorized by ESC management to identify existing and foreseeable hazards, to take prompt corrective action, and **to stop work at any time, for any safety reason, without seeking approval and without adverse consequence.** In his absence, the designated alternate Competent Person is **Derek Snow, Treasurer** (support@earthsupportcorp.com), who holds the same authority to identify hazards, take prompt corrective action and stop work. Derek Snow is also the person to whom every stop-work action is escalated. Management sponsor and signatory for this Program is **Derek Snow, Treasurer**. ESC has no other officers and no separate safety director; these two individuals hold the program.

3.0.7 Emergency stop. Any ESC employee — and any other worker on the site — may give an emergency stop signal to the rig operator at any time. **ESC company rule: the operator shall accept and obey an emergency stop signal from ANY person, regardless of who gives it.** All other operating signals are accepted only from the designated qualified signal person.

3.1 Site-Specific Safety Plan and Job Hazard Analysis

3.1.1 Written plan required before work begins. ESC policy — implemented through the accident-prevention program required by 29 CFR 1926.20(b)(1)–(2): before initiating any drilled-shaft operation ESC will develop a **written site-specific safety plan** and **Job Hazard Analyses (JHAs)** for each unique drilled-shaft activity. The plan will address, at minimum:

1. Emergency action and emergency contacts;
2. **Location of all utilities — both above grade and below grade** (see §3.4 and §3.5);
3. Designated areas for equipment operation, equipment staging, material storage and spoil stockpiling;
4. Rig assembly / disassembly (mast raising and lowering) sequences and designated mast-up/mast-down staging locations;
5. Drill rig operation, including the working-platform and ground-bearing basis;
6. Materials handling — casing, tooling, reinforcing cages, tremie;
7. Task-specific training;
8. Personal protective equipment;
9. Concrete placement and slurry handling;
10. Open-shaft protection and the ESC no-man-entry policy;
11. Project demobilization and site restoration.

3.1.2 Approval and review. The site-specific plan will be transmitted to the project constructor / general contractor for **review and approval**, and ESC will request a **preconstruction meeting** with the project constructor before mobilizing. The Competent Person will instruct every worker exposed to the drilled-shaft operation in the plan and in every applicable JHA **before that worker begins work** — the employee-instruction duty at **29 CFR 1926.21(b)(2)** — and will document the review with a signed sign-in sheet.

3.1.3 Living document. As work procedures change, the plan and JHAs will be modified and the changes communicated to all affected personnel. Current copies of the plan and JHAs will be **maintained on the project** and available for review until drilled-shaft operations are complete.

3.1.4 Daily pre-task briefing. Before each shift the Competent Person will conduct and document a pre-task briefing covering: today's shafts and sequence; overhead conductors and clearance distances; located underground utilities and soft-dig requirements; the restricted access zone and swing-radius barricade; the day's silica tasks and durations; the open-hole plan; the emergency/rescue plan; and any change since yesterday.

3.1.5 Project constructor's disclosure duty. ESC will obtain in writing, before mobilization, the geotechnical report, boring logs, groundwater data, existing utility drawings, as-builts and any known subsurface hazards (voids, tanks, abandoned foundations, contaminated soil) in the possession of the project constructor or owner. **29 CFR 1926.1402(c)(2)** places that disclosure duty on the controlling entity for cranes, and **ESC requires the same disclosure, in writing in its subcontract, for its drill rig.** ESC will not begin drilling on undisclosed subsurface conditions.

3.2 Mobilization, Demobilization and Equipment Offload

3.2.1 Transport to site. The drill rig, tooling and casing are transported to site on a lowbed by a licensed heavy-haul carrier engaged by ESC for each mobilization. Loading, securement, permitting and route/height clearances are the responsibility of the transporter. **Before dispatch, ESC confirms with the carrier that the route has adequate vertical clearance for the loaded rig with the mast down and pinned, and that every oversize/overweight permit required by MassDOT and by each municipality on the route has been issued and is in the driver's possession.** ESC does not accept a "we'll sort the permit en route" answer; an unpermitted lowbed is turned around. The following is completed on the mobilization record for each haul:

Carrier: _____ Driver: _____ Date of haul: _____

Loaded height (mast down, pinned): _____ ft Route vertical clearance verified by: _____

Oversize/overweight permit no. (MassDOT): _____ Municipal permit no. (if required): _____

3.2.2 Offload area. The Competent Person will designate and mark the offload area before the truck arrives. The offload area must be:

- Firm, drained and level within the rig manufacturer's tolerance;
- Clear of overhead conductors, trees and structures across the full envelope of the mast in the raised **and** lowered position;
- Clear of pedestrians, parked vehicles and other trades, and barricaded;
- Clear of known underground utilities, vaults, septic structures and unsupported trench backfill.

3.2.3 Offload procedure.

1. Truck chocked; driver out of the cab and out of the ram/roll zone.
2. Only the qualified, ESC-authorized rig operator (§3.3.2) operates the rig off the trailer. No one else.
3. A **qualified signal person** is positioned in full view of the operator throughout. This is an ESC company requirement for every rig movement.
4. **No employee is permitted between the rig and the trailer, under the rig, or on the trailer deck** while the rig is tracking off.
5. Ramps/dunnage are rated, seated and secured; the trailer deck is cleaned of ice, mud and grease.
6. The mast remains **lowered and pinned** during all transport and offload. The mast is raised only after the rig is on the working platform, in the designated mast-up location, and after §3.4 overhead-line checks are complete.

3.2.4 Tooling and casing offload. Augers, core barrels, cleanout buckets, kelly extensions, chisels and casing sections are offloaded with a rated lifting device furnished by others (with certified rigging), **not by improvising with the drill rig's auxiliary winch** — the auxiliary winch is never used to offload a trailer (A10.23 §12.11; §3.7.3). Slings, shackles and hooks are inspected before each use per 29 CFR 1926.251; damaged rigging is removed from service and tagged.

3.2.5 Storage. Casing and tooling are stored in the designated laydown area, blocked and chocked so they cannot roll. Casing is never stacked in a pyramid without end blocking. Long tooling is laid down horizontally; nothing is stood upright unless secured against falling.

3.2.6 Demobilization. Before the crew leaves the site for the last time:

- Every shaft is concreted, or covered and barricaded per §3.9 and turned over in writing to the project constructor;
- All spoil is removed or graded per contract;
- All ESC barricades, covers, signage and traffic-control devices are removed **only after** the hazard they protected is gone;
- The rig is inspected, the mast lowered and pinned, and hydraulic systems relieved before loading;
- Site restoration and final walk-through are documented with the project constructor.

3.3 Rig Transport On Site, Setup, Ground Bearing and Stability

3.3.1 The controlling principle. Drill rig overturn is one of the two leading killers in foundation drilling (the other is power line contact). It is caused by inadequate ground support, an out-of-level machine, mast inclination beyond limits, and — most often — **misuse of the auxiliary winch.** Every rule in this section exists to prevent tipping.

3.3.2 Operator qualification. ANSI/ASSP A10.23 §12.19: "Drilled shaft equipment operators shall be **qualified and authorized by their employers** to operate such equipment." **ESC does this in writing, machine by machine** — an operator is authorized to run *that* rig, not "a rig." ESC will maintain a signed Operator Qualification & Authorization record for each operator and each machine. Certification (e.g., NCCCO/ADSC Foundation Drill Rig "FDR" certification) is welcome evidence but is **not by itself qualification** — ESC must additionally evaluate the operator on the specific machine and task, and re-evaluate whenever an operator is assigned a substantially different machine or task.

What ESC brings. ESC self-performs this work and mobilizes **only the drill rig — nothing else.** ESC does its own lifting with the **drill rig's auxiliary winch**, used within the manufacturer's rated capacity and load chart (**ANSI/ASSP A10.23 §12.11**): the winch sets the drill rig's tooling, temporary casing and reinforcing cages straight into the shaft, near-vertical. **The drill rig is the only ESC machine on the site. Spoils are removed by others (the general contractor)** — that machine is the GC's, and no ESC make/model is attached to it. The hazards any GC-furnished machine creates are still controlled under this program; only whose machine it is changes.

Machine	Make / model	Role on a drilled-shaft operation	Provided by
Drill rig	**the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization**	Rotary drilling, augering, rock socketing; and, on its own auxiliary winch within the manufacturer's chart (A10.23 §12.11), setting tooling, temporary casing and reinforcing cages straight into the shaft; self-contained crawler-mounted foundation drill	**ESC**

Machine	Make / model	Role on a drilled-shaft operation	Provided by
Spoils-removal machine	Furnished by others — no ESC make/model	Removal of drilled spoils from the shaft collar and work area	Furnished by others (GC)

Serial numbers, rated capacities, mast height, degree-of-level tolerance, track bearing pressure and wind limits are machine-specific. For the drill rig they are read from that machine's operator's manual and recorded on the daily inspection form; for a machine furnished by others they are the provider's, read from that machine's own data. They are never estimated and never carried over from another machine.

The Operator Qualification & Authorization record (Appendix 3-L) is completed for each operator and each machine before that operator runs that machine:

Rig: the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization Serial no.: _____

Operator (print): _____ ESC authorization signed by: _____

Evaluated on this machine and this task on: _____ Evaluator (print/sign): _____

Re-evaluation required on assignment to a substantially different machine or task — next due: _____

Where an operator holds a third-party certification — for example the NCCCO/ADSC Foundation Drill Rig ("FDR") certification — the certificate is issued by the certifying body directly to the operator; a copy is obtained from the operator and filed with this record. **A certification card supplements ESC's qualification of the operator on this machine. It does not replace it, and ESC does not treat it as qualification by itself.**

ESC sets its reinforcing cages and handles its temporary casing on the **drill rig's auxiliary winch**, within the manufacturer's rated capacity and load chart (**ANSI/ASSP A10.23 §12.11**), operated by the ESC-qualified and ESC-authorized rig operator (§12.19). ESC brings no separate hoisting machine, so no separate operator-certification question arises on ESC's scope; ESC's crew provides the qualified rigger and qualified signal person, and the cage is set straight into the shaft, near-vertical, never lifted at a radius.

3.3.3 Manufacturer's manual is mandatory. ESC company rule: the rig manufacturer's operation, inspection and maintenance manual is kept on the rig at all times, and the manufacturer's recommendations for assembly, disassembly, inspection, maintenance and operation shall be followed. The manual is not advisory paperwork — it is the controlling document for this machine. It sets the auxiliary-winch limits that **ANSI/ASSP A10.23 §12.11** makes binding (§3.7.2), and where no specific OSHA standard reaches a drill-rig hazard, the manual and the industry consensus standard are what OSHA measures ESC against under **OSH Act § 5(a)(1)**. **No modification** to the rig, mast, kelly, tooling interface or winch is permitted without the written approval of the equipment manufacturer.

3.3.4 Working platform — the ground must be engineered, not assumed. The rig shall not be assembled, set up or operated unless the ground on which it is moved or placed is **firm, drained and graded** to the extent that — in conjunction with supporting materials (mats, cribbing, blocking) where necessary — the **equipment manufacturer's specifications for adequate support and degree of level are met** — the rule **29 CFR 1926.1402(b)** imposes on cranes, which **ESC applies to its dedicated drill rig as company policy** (§3.4.2 applies the same one-rule-for-the-crew logic to power lines).

ESC's rules:

1. **The controlling entity provides the working platform. 29 CFR 1926.1402(c)(1)** places the duty to provide adequate ground conditions on the controlling entity / project constructor. ESC will require, in writing in its subcontract, that the GC provide a working platform meeting the rig manufacturer's ground-bearing and degree-of-level specifications, and disclose all voids, tanks and utilities beneath the set-up area. **If the platform is not provided, ESC does not drill.**
2. ESC will read the **track bearing pressure** and the **maximum degree of level** for the drill rig from that machine's operator's manual and provide both figures to the GC in writing before mobilization. Platform design, where required, follows the **EFFC/DFI Guide to Working Platforms** (current edition) and, where used, BRE Report BR470 methodology. **Where a designed working platform is required, it is designed and stamped by a Massachusetts-registered Professional Engineer engaged for that purpose; the stamped design carries the engineer's name, license number and seal, and is in the site file before the rig is set.** ESC does not set the rig on an undesigned platform where design is required.

Track bearing pressure (from the rig manual): _____ psf Max degree of level (from the rig manual): _____ °

Working platform design on file — dated: _____ Provided by: □ GC □ ESC-engaged PE

1. **Design for operating pressure, not static weight.** Crowd force, mast moment, extraction (casing pull) force and any auxiliary-winch load transfer to the tracks and produce edge pressures far above the machine's static average. Never design to the margin.
2. **An asphalt parking lot is not a working platform.** A paved surface looks competent and is not: it is a thin wearing course over an unknown subbase, frequently over utility trenches, backfilled vaults and voids. ESC will treat paved surfaces as unverified until the subbase is confirmed, and will **mat the rig** wherever bearing is questionable, wherever a utility trench is crossed, and **always for casing handling and casing extraction**.
3. **Mats and cribbing.** Crane/timber mats or engineered composite mats are used under **both** tracks. **Mat type, thickness and layout are selected to spread the rig's track bearing pressure — the figure read from the drill rig's operator's manual — to within the allowable bearing capacity of the platform.** Mats are laid flush, gapped tight, and not cantilevered over a trench, curb or slope crest. Cribbing is sound, level and fully bearing. **Read the maximum permitted cribbing/blocking height from the rig's operator's manual, post it in the cab, and do not exceed it.** Both values are recorded at setup:

Mat type / size in use: _____ Mats under both tracks: □

Max cribbing height per the rig's operator's manual: _____ in Actual cribbing height: _____ in

1. **Level check.** Before drilling each shaft the operator verifies that the machine is level within the manufacturer's tolerance and that mast inclination is within the manufacturer's limit. **Read the degree-of-level tolerance and the mast inclination limit for this rig from the drill rig's operator's manual, post both in the cab in the operator's view, and confirm both before every setup.** These are machine-specific values: they are not estimated, not taken from another machine, and not judged by eye. Tracks are **fully extended** where the machine is so equipped.

Machine level, this setup: _____ ° Within manual tolerance: □ Mast inclination: _____ ° Within manual limit: □

1. **Setback from open excavations and slopes.** The rig will not be set up so that any track, outrigger or mat bears within the setback distance established for this site by the **geotechnical engineer of record** from the crest of an open excavation, trench, slope or previously drilled shaft. The geotechnical engineer of record for the project is identified on the counterparty block at Section 1.4.6, the setback is taken from that engineer's report and the boring logs, and the value in force is recorded on the setup record. Where the setback cannot be achieved, **the required support is determined by a Massachusetts-registered Professional Engineer, whose stamped determination — carrying the engineer's name, license number and seal — is in the site file before the rig is set.**

Setback in force at this site: _____ ft Source (geotechnical report / PE determination): _____ Date: _____

3.3.5 Undermining at the collar. The Competent Person will ensure there is no caving, raveling or undermining of the soil at the surface near the shaft, and will **promptly initiate corrective action** (surface casing, backfill, relocation of the rig) if such a condition exists. This is the prompt-corrective-action duty that **29 CFR 1926.20(b)(2)** and **29 CFR 1926.651(k)(2)** already place on the Competent Person, and ESC applies it to the ground the rig is standing on as well as to the shaft. A rig track bearing on ground being undermined by an adjacent shaft is a tipping event in progress.

3.3.6 Tracking / walking the rig on site.

1. **ESC company rule: a qualified signal person shall be positioned in full view of the operator before any drilled-shaft equipment is relocated on site.** Standard hand or voice signals are used. Radios are provided where line of sight or noise requires them.
2. The **mast is lowered** for all travel unless (a) the travel path has been surveyed and confirmed to pass nowhere under or within the required clearance of any overhead conductor, structure or tree, **and** (b) a dedicated spotter is used (see §3.4.7). ESC's default is: **mast down to move.**
3. **No travel with a suspended load.** Nothing is carried on the auxiliary winch while the rig tracks.
4. Travel speed is walking pace. Terrain effects — curbs, curb cuts, crowned pavement, ruts, trench backfill — bounce and sway the mast and can pitch it several feet. The travel path is walked and cleared by the signal person before the rig moves.
5. **No person is permitted in the travel path, in the pinch zone between the rig and any fixed object, or between the tracks and a curb, wall, vehicle or open shaft.**
6. **No travel at night or in poor visibility** near overhead conductors. See §3.4.7.

3.3.7 Restricted Access Zone (RAZ) and swing radius.

The Restricted Access Zone is an ESC company control. ESC imposes it on itself and on every person on the site who comes near its rig; the rules below are enforced by ESC's Competent Person with stop-work authority.

1. ESC will establish a **Restricted Access Zone** around the drilling and hoisting area to prevent access by persons not directly involved in the operation. The RAZ is **supervised by the Competent Person**.
2. The RAZ encompasses the rig, the drilling attachments, the shaft being drilled, the spoil area, the materials and area needed for the operation, **and the auger spin-off arc** — the sector into which spoil is flung when the auger is spun off. Spin-off is a struck-by hazard measured in tens of feet, not inches.
3. **The full swing radius of the drilling equipment shall be fully barricaded.** This is a *hard* barricade against the crush hazard between the rotating upper works/counterweight and any fixed object — not cones and caution tape alone. **29 CFR 1926 Subpart CC** requires the swing-radius area of a crane's rotating superstructure to be controlled and barricaded, and ESC applies the identical control to the drill rig.
4. The RAZ **moves with the work** and is marked with barricade, tape, cones or equivalent visual identification, and is re-established at each new shaft location before drilling begins.
5. **Only personnel engaged in the drilled-shaft installation are allowed inside the RAZ.** Only materials necessary for the operation being performed are stored inside it.
6. **Intrusion protocol.** When another contractor's workers, owner's representatives, or members of the public enter the RAZ without approval, work stops and the Competent Person **promptly notifies the project constructor in writing**; ESC will require the project constructor and the site owner to take reasonable steps to prevent such intrusions. ESC will keep a written intrusion log. On sites with active vehicular or pedestrian traffic (e.g., an occupied municipal or public-safety facility), ESC will obtain a **written agreement with the GC and the facility owner** covering lot/area closure, traffic control, pedestrian routing and after-hours security **before mobilizing**, and will treat that agreement as a bid assumption.
7. **Traffic control.** Where ESC's RAZ affects a public way, a parking lot, or an emergency-vehicle route, temporary traffic control will conform to **MUTCD Part 6** and the requirements of the authority having jurisdiction. Flaggers are trained and equipped; a flagger is never also the dedicated power-line spotter or the signal person.

3.3.8 Documented shift inspection. ESC company rule: every piece of drilled-shaft installation equipment is inspected at least once every shift, before operation, and the inspection is documented. This discharges the frequent-and-regular-inspection duty of **29 CFR 1926.20(b)(2)**, and it is stricter than that standard requires — ESC inspects every shift and signs for it. ESC's Daily Drill Rig Inspection form (Appendix 3-A) includes, at minimum:

- Structural: mast, mast pins/locks, kelly bar, rotary/rotary drive, tracks, undercarriage, counterweight
- Hydraulics: hoses, fittings, cylinders, leaks, pressure-line guarding (§3.7.9)
- Wire rope, sheaves, auxiliary winch, hooks, latches
- Guards in place over rotating components; access covers secured
- Controls, horn, backup alarm, lights, mirrors/cameras
- Fire extinguisher, first aid kit, eyewash, spill kit
- **Overhead:** conductors identified, clearance verified, warning line/barricade in place, decal at operator's station legible (§3.4)
- **Stability:** machine level within tolerance, tracks fully extended, mats/cribbing in place and bearing
- **Silica:** water supply charged, nozzles clear and aimed, hoses intact, dust shroud/collector intact, filter clean, bags not overfilled, cab seals and HVAC functioning
- Operator's manual present on the machine

Defects that affect safe operation take the rig **out of service** until repaired. The Competent Person signs and retains the forms.

3.4 Overhead Power Lines

3.4.1 The legal position — stated honestly. 29 CFR 1926.1400(c)(11) excludes **"dedicated drilling rigs"** from Subpart CC. A self-contained crawler- or carrier-mounted foundation drill rig with a fixed mast is a dedicated drilling rig, and Subpart CC's power-line provisions (1926.1407, .1408, .1409, .1410, .1411) and ground-conditions provision (1926.1402) therefore do not, as a matter of law, bind that machine. **ESC does not use this exclusion as a shield.** The exclusion is not a defense against electrocution, and it is not a defense against a citation:

- **29 CFR 1926.600(a)(6)** *does* bind mechanized equipment, including the rig: minimum clearance from an energized line rated **50 kV or below is 10 feet**; above 50 kV it is 10 ft plus 0.4 in per kV over 50 kV, or twice the length of the line insulator, but never less than 10 ft. A person shall be designated to observe clearance and give timely warning wherever the operator cannot maintain clearance visually.
- **29 CFR 1926.416(a)(1)** prohibits permitting an employee to work in such proximity to a power circuit that the employee could contact it, unless the circuit is de-energized and grounded or effectively guarded.
- **29 CFR 1926.416(a)(3)** requires the employer, **before work begins**, to ascertain by inquiry, direct observation or instruments whether any energized circuit — exposed or concealed — is located such that the work may bring any person, tool or machine into physical or electrical contact with it; to **post and maintain warning signs**; and to advise employees of the location, the hazards and the protective measures.
- **29 CFR 1926.1408(a)(2)(i)** and **29 CFR 1926.1410** carry the whole argument for any equipment ESC voluntarily holds to Subpart CC, including the dedicated drill rig: if the required clearance cannot be maintained, the line is **de-energized and visibly grounded**, relocated, or otherwise rendered harmless by the utility **before work begins** — and ESC does not use the §1926.1410 "work inside Table A" route at all (§3.4.11).
- **OSH Act § 5(a)(1)** allows OSHA to cite a recognized hazard by reference to the consensus standard and the manufacturer's manual.
- **M.G.L. c. 166 §§ 21A–21G** applies to ESC in Massachusetts independently of OSHA.

3.4.2 ESC policy. ESC voluntarily adopts the Subpart CC power-line regime — the 20-foot planning trigger, Table A, Table T, encroachment prevention and dedicated spotters — as company policy for ALL ESC equipment, including the dedicated drill rig. One rule for the crew is safer than two. The crew does not have to remember which machine is legally exempt from what — on an ESC site, every machine works to the same clearance.

3.4.3 Every line is energized. Every overhead conductor is **presumed energized** unless the utility owner/operator confirms in writing that the line has been and continues to be **de-energized AND it is visibly grounded at the worksite**, and ESC has visually verified the ground on site. A verbal assurance from anyone — including the utility — is not sufficient. (29 CFR 1926.1408(e).)

3.4.4 Pre-job overhead line survey. Before mobilization, ESC will complete a documented **Overhead Line Survey** (Appendix 3-B) identifying every conductor over or near the work area, its owner, its voltage, its height, and its horizontal offset from every planned shaft, travel path and mast-up location. Voltage is obtained by **written request to the utility owner/operator**; the utility must provide the voltage information **within two working days** of the request (29 CFR 1926.1408(c)). Warning signs are posted and the crew is briefed (29 CFR 1926.416(a)(3)).

The utility. Before mobilization the Competent Person establishes, for each site, which electric distribution utility owns and operates the overhead conductors over and adjacent to the work — including whether the community is served by a municipal light plant rather than an investor-owned utility — and records it. ESC directs its M.G.L. c. 166 §21E notification and its 29 CFR 1926.1408(c) voltage request to that utility's **business/commercial customer line** (ESC is a commercial caller, not a residential customer), and asks to be routed to the group that handles line protection, line-hose guards, de-energization and temporary relocation for contractors. **The utility's 24-hour outage and downed-wire number is recorded on the site emergency card — and 911 is called first in any contact or downed-wire emergency.** ESC records the name and direct number of the utility representative it is routed to, the date, and the utility's written answer, in the site binder.

*(In eastern Massachusetts the electric utility is commonly Eversource Energy — 24-hr outage and downed wire **1-800-592-2000** — and the gas utility across much of the state is National Grid — gas emergency **1-800-233-5325**, see §3.5.7. Both are confirmed per site rather than assumed.)*

Electric distribution utility for this site: _____ Business line: _____ 24-hr emergency line: _____

Utility rep (name/title): _____ Direct no.: _____ Date routed: _____

Read the mast height at true vertical for the drill rig from its operator's manual, and measure the height of every conductor above grade, before mobilization. Both numbers are needed to apply 29 CFR 1926.1408(d)(2)(ii): a rig whose mast at true vertical is not more than 20 ft (or the Table A distance) below the plane of the line **may not pass under that line at all** unless it is de-energized and visibly grounded.

Conductor owner/operator: _____ Utility contact (name/title): _____

Voltage request sent (date): _____ Written response received (date): _____

Nominal line voltage as stated in writing by the utility: _____ kV Table A clearance that follows: _____ ft

Conductor height above grade: _____ ft Rig mast height at true vertical (from the rig manual): _____ ft

Overhead Line Survey completed by: _____ Date: _____

Until the voltage is in ESC's hands in writing, no reduced (Table A) distance is available to ESC and the 20-foot rule governs — full stop (29 CFR 1926.1408(a)(2)(iii)).

3.4.5 Minimum approach distances — OPERATING (Table A). These are the ESC operating clearances, and they are **29 CFR 1926.1408 Table A** verbatim — applied by ESC to every machine on the site, exempt or not (§3.4.2):

Line voltage (nominal, phase-to-phase)	Minimum clearance while operating
up to 50 kV	**10 ft**
over 50 to 200 kV	15 ft
over 200 to 350 kV	20 ft
over 350 to 500 kV	25 ft
over 500 to 750 kV	35 ft
over 750 to 1,000 kV	45 ft
over 1,000 kV	As established by the utility owner/operator or by a registered professional engineer who is a qualified person with respect to electrical power transmission and distribution

3.4.6 The 20-foot rule and the three Options. Before beginning equipment operations, ESC will identify the work zone (either by demarcating boundaries the operator may not cross, or by defining it as 360° around the equipment out to its maximum working radius) and determine whether any part of the equipment, load line or load **could get closer than 20 feet** to a power line. If it could, ESC will elect **in writing** one of the following (29 CFR 1926.1408(a)):

- **Option 1 — De-energize and visibly ground.** Confirm from the utility owner/operator that the line has been de-energized **and visibly grounded at the worksite** (29 CFR 1926.1408(a)(2)(i)). **This is ESC's preferred option and ESC's default for any shaft, travel path or mast-up location within 20 feet of a conductor.** It is the only option that eliminates the hazard rather than managing it. **ESC's rule, stated plainly: if the required clearance cannot be maintained, the line is de-energized and visibly grounded, moved, or otherwise rendered harmless by the utility BEFORE any work activity begins — ESC does not drill under a hot wire it cannot clear.** Relocation of the line, or installation of insulating line hose/cover-up **by the utility**, are acceptable equivalents — and they are the same three remedies **M.G.L. c. 166 §21B** contemplates (mechanical barriers, de-energization, or temporary relocation by agreement with the utility).
- **Option 2 — 20-foot clearance.** No part of the equipment, load line or load gets closer than 20 ft. Encroachment prevention per §3.4.8 applies.
- **Option 3 — Table A clearance.** Voltage determined; the corresponding Table A distance maintained. Encroachment prevention per §3.4.8 applies.

3.4.7 Traveling with the mast up — Table T, and the geometric fact that ends the argument. Equipment traveling **with no load** is governed by 29 CFR 1926.1411, and the clearances are **different and smaller** than Table A. This is the single most misunderstood point in the standard:

Line voltage	Minimum clearance while traveling, no load (Table T)
up to 0.75 kV	4 ft
over 0.75 to 50 kV	**6 ft**
over 50 to 345 kV	10 ft
over 345 to 750 kV	16 ft
over 750 to 1,000 kV	20 ft
over 1,000 kV	As established by the utility owner/operator or a qualified registered PE

29 CFR 1926.1411 requires that the mast be **lowered sufficiently** to meet Table T; that the clearance be maintained accounting for **equipment speed and terrain effects** (bouncing and swaying over ruts, curbs and slopes); that a **dedicated spotter** be used if any part of the equipment will get closer than 20 ft to the line; and that when traveling at **night or in poor visibility**, the power lines be illuminated or otherwise identified and a safe path of travel be identified and used.

ESC's hard rule: a foundation drill rig mast stands tens of feet above the tracks. **Read the mast height at true vertical for the drill rig from its operator's manual, confirm it by measurement at rig-up, post it in the cab, and record it on the Overhead Line Survey (§3.4.4) — Mast height at true vertical: _____ ft.** Overhead distribution conductors cross parking areas far lower than that, and secondary can be lower still over areas not subject to truck traffic. **In practical terms a mast-up rig cannot pass beneath a distribution conductor — contact is geometrically guaranteed.** Therefore:

> **THE MAST IS LOWERED FOR ALL TRAVEL, OR THE RIG IS WALKED ON A SURVEYED PATH THAT NEVER PASSES UNDER OR WITHIN THE REQUIRED CLEARANCE OF ANY CONDUCTOR. A DEDICATED SPOTTER IS USED. THERE IS NO TRAVEL AT NIGHT OR IN POOR VISIBILITY NEAR CONDUCTORS.**

3.4.8 Encroachment prevention (required under Option 2 or Option 3). Per 29 CFR 1926.1408(b), ESC will do **all** of the following — these are cumulative, not alternatives:

1. **Planning meeting** with the operator and all workers who will be in the area of the equipment or load, reviewing the location of the lines and the steps to prevent encroachment and electrocution. Documented with a sign-in sheet.
2. **Non-conductive tag lines only.** Poly/nylon. No wire-core, no wet manila, no chain.
3. **Erect and maintain an elevated warning line, barricade or line of signs**, in view of the operator, equipped with flags or similar high-visibility markings, at 20 ft from the power line (or at the Table A distance under Option 3). If the operator cannot see the warning line, a dedicated spotter is used. *This is the item most often skipped and most often cited.*
4. **AND at least one** of: (i) a proximity alarm set to give the operator sufficient warning; (ii) a **dedicated spotter** in continuous contact with the operator; (iii) a device that automatically warns the operator to stop movement; (iv) a device that automatically limits range of movement; (v) an insulating link/device between the end of the load line and the load.

ESC's standard package is: documented planning meeting + non-conductive tag lines + elevated flagged warning line + **dedicated spotter with radio**.

3.4.9 Dedicated spotter — the four conditions. A "dedicated spotter" only counts if **all** of the following are met (29 CFR 1926.1408(b)(4)(ii)):

(A) The spotter is equipped with a **visual aid** to identify the minimum clearance distance — a clearly visible line painted on the ground, a line of stanchions or cones, or a set of clearly visible line-of-sight landmarks;
(B) The spotter is **positioned to effectively gauge** the clearance distance;
(C) The spotter uses equipment enabling **direct communication with the operator** (radio);
(D) The spotter gives **timely information** to the operator so clearance is maintained.

The spotter is **trained** for the task (29 CFR 1926.1408(g)(2); 1926.1430(g)) and **has no other duty.** A spotter who is also rigging, flagging traffic, or signaling the load is not a spotter. On a paved site, ESC's standard visual aid is a **painted line or a line of cones on the pavement marking the Table A offset from the conductor.** Spotter designation is in writing, per shift, on Appendix 3-D:

Dedicated spotter (print): _____ Signature: _____ Date of shift: _____

Spotter trained under 29 CFR 1926.1408(g)(2) — training provider: _____ Date of training: _____

Visual aid in use (painted line / line of cones / line-of-sight landmarks): _____

Designated by (Competent Person): _____ No other duty assigned this shift: □

3.4.10 Raising and lowering the mast = assembly/disassembly. Raising or lowering the mast is functionally assembly and disassembly, governed by 29 CFR 1926.1407:

> **1926.1407(c): Assembly or disassembly BELOW an energized power line is PROHIBITED.** No spotter, warning line or procedure cures it. The line must be de-energized **and visibly grounded** by the utility.

ESC will designate and mark **mast-up / mast-down staging locations** on the site plan that lie entirely outside the swept envelope of every conductor, and will raise and lower the mast **only** at those locations. The A/D planning meeting, non-conductive tag lines and at least one encroachment-prevention measure per 1926.1407(b) apply.

3.4.11 Working inside the Table A zone — ESC does not do it. 29 CFR 1926.1410 permits operations inside the Table A minimum approach distance only if the employer *demonstrates* both that the work cannot be done at or outside Table A **and** that de-energizing, grounding or relocating the line is infeasible — and then only with a utility-or-PE-established clearance, a formal planning meeting, deactivation of automatic reclosing circuits, an insulating link, non-conductive rigging, a dedicated spotter, an elevated warning line, barricades, utility-installed line hose, documented procedures immediately available on site, and a designated person present with authority to stop work.

> **ESC POLICY: ESC DOES NOT WORK INSIDE THE TABLE A MINIMUM APPROACH DISTANCE.** If a shaft cannot be drilled while maintaining Table A clearance, the response is to have the utility **de-energize, relocate or cover** the line, or to re-sequence the work — **never** to attempt a 1926.1410 procedure.

3.4.12 No one touches the rig and the ground at the same time. ESC ABSOLUTE RULE: during drilling, no one is in contact with the drill rig and the ground at the same time. This is the touch-potential rule — if the rig energizes, a person bridging the machine and the earth is the path to ground — and it is written into every drilling JHA. It is also how ESC discharges **29 CFR 1926.416(a)(1)**, which prohibits ESC from permitting an employee to work in such proximity to a power circuit that the employee could contact it unless the circuit is de-energized and grounded or effectively guarded.

3.4.13 Warnings at the operator's station. Warnings about power-line contact are **posted at the operator's station**. ESC will fit and maintain a power-line contact decal in the cab of each rig. For any machine ESC operates under Subpart CC, **29 CFR 1926.1407(g)** requires at least one electrocution-hazard warning legible from the operator's station and at least two legible from the ground; **ESC posts the same warnings on the dedicated drill rig.** Separately and independently, **M.G.L. c. 166 §§ 21C, 21D and 21F** require the yellow 5 in × 7 in sign reading **"WARNING—Unlawful to operate this equipment within SIX FEET of high voltage lines"** to be posted in plain view of the operator inside the cab and on the outside of the equipment — and §21C names the **"drilling rig"** among the machines required to carry it (see §3.4.15).

3.4.14 ELECTRICAL CONTACT EMERGENCY PROCEDURE — memorize this. Every operator and crew member assigned to work with the equipment is trained on all of the following (29 CFR 1926.1408(g)(1)):

1. **IF THE RIG CONTACTS A LINE, THE OPERATOR STAYS IN THE CAB.** The cab is the safest place. Do not step down. Try to break contact by moving the machine clear if it can be done safely.
2. **Leave the cab only if there is imminent danger of fire, explosion or another emergency.** If you must leave: **JUMP CLEAR — land with both feet together, never touching the machine and the ground at the same time.** Then **shuffle or hop away with your feet together**, in small steps, until you are well clear — to avoid **step potential** (a lethal voltage gradient in the ground).
3. **Everyone else stays away.** Do not touch the machine, the load, the load line, the tooling or anything in contact with them. Do not approach to help. You will be the second casualty.
4. Treat the ground around the machine as energized.
5. Call 911 and the utility. Only the utility de-energizes the line. Do not assume a downed line is dead — reclosers can re-energize it automatically.
6. Understand that an insulating link, a proximity alarm and a range-control device are **not substitutes** for maintaining clearance and can fail.
7. Understand that grounding the equipment does **not** protect against all hazards.

3.4.15 Massachusetts overhead high-voltage statute — M.G.L. c. 166 §§ 21A–21G. This statute applies to ESC in Massachusetts **independently of federal OSHA**. It is enforced by criminal prosecution and by the utility's civil claim, not by OSHA. Massachusetts has no State Plan for private-sector construction, so federal OSHA applies in full **and** the statute applies in full. The operative provisions:

Provision	The rule
§ 21A — "in close proximity"	No person shall require or permit an employee to operate a crane, power shovel or other construction equipment — the statute names **"well drilling," "pile driving"** and **"hoisting equipment" by name** — in close proximity to overhead high voltage lines unless contact has been effectively guarded against. **"In close proximity" means within SIX FEET of such lines.**
§ 21B — the prohibition	Operating or erecting any tool, machine or equipment capable of **vertical, lateral or swinging motion** within six feet of an overhead high voltage line is **prohibited**, except where the line has been guarded by (1) **mechanical barriers**, or (2) **de-energized and grounded where necessary**. Where neither is practicable in the utility's opinion, **mutually agreeable arrangements for temporary relocation** of the conductors must be made. §21B(3) additionally requires an **insulated cage-type guard or other approved protective device** on the boom or arm of hoisting or other construction equipment operating in proximity to the lines (backhoes and dippers excepted).
§ 21F — "high voltage"	**A voltage in excess of FOUR HUNDRED AND FORTY (440) VOLTS**, measured conductor-to-conductor **or** conductor-to-ground.

Provision	The rule
§§ 21C, 21D, 21F — the sign	A weather-resistant **warning sign, not less than 5 in × 7 in, yellow background with black lettering, legible at twelve feet**, reading **"WARNING—Unlawful to operate this equipment within SIX FEET of high voltage lines"** — posted **in plain view of the operator inside the cab** and **on the outside of the equipment** where mechanics and ground crew can read it. §21C names the **"drilling rig"** among the machines required to carry it.
§ 21E — notify the utility	**Before any operations are performed within six feet of an overhead high voltage line, the person responsible for the work shall promptly notify the utility owning or operating the line**, and the work shall be performed **only after satisfactory arrangements have been negotiated** with the utility.
§ 21G — penalties and liability	Criminal: a fine of **not less than $100 nor more than $1,000**, or imprisonment for **up to one year**, or both. Civil: if the violation results in physical or electrical contact with the line, the violator is liable to the utility for **all damage resulting from the contact and for all liability the utility itself incurs** as a result.

Two numbers that catch people out. First, **440 volts is the threshold — not 600 V and not 1,000 V.** A standard 277/480 V commercial service drop — exactly what a solar carport ties into — is "high voltage" under Massachusetts law. Do not assume "it's only secondary, so the statute doesn't apply." Second, **the six-foot figure is a FLOOR, not a permission.** It never authorizes ESC to work closer than the OSHA distance.

ESC's compliance position — both regimes, the stricter distance.

- **Distance:** OSHA requires **20 feet** unless the line is de-energized and visibly grounded, or the voltage has been obtained from the utility and the reduced **Table A** distance (10 ft up to 50 kV) is held with the full encroachment-prevention package. Twenty feet is the greater distance, so **20 feet is ESC's operating limit on every site unless and until the utility provides the line voltage in writing.**
- **Notification:** ESC notifies **the utility owning the line** before any operation within six feet of an overhead high voltage line and does not work until satisfactory arrangements have been negotiated. **The statute requires prompt notification; it does not on its face require it to be in writing. As a matter of ESC policy the notification is made in writing and the utility's response is retained on site**, so that both the "satisfactory arrangements" required by §21E and the voltage information required by 29 CFR 1926.1408(c) are documented.
- **Signs:** ESC fits and maintains the yellow 5 in × 7 in "SIX FEET" sign in the cab and on the outside of the rig, in addition to the electrocution-hazard warnings required by 29 CFR 1926.1407(g) (at least one in the cab, at least two on the outside of the equipment).
- **Cage guard:** where a cage-type boom guard or equivalent protective device is required by §21B(3), ESC consults the utility and the Massachusetts Department of Labor Standards before working within the statutory distance. **Note carefully: per 29 CFR 1926.600(a)(6)(v), fitting such a guard does NOT alter any other clearance requirement — a cage guard buys ESC no distance whatsoever. The 20-ft / Table A distances still apply in full.** This is a classic and fatal misunderstanding, and it is stated here so no ESC operator ever makes it.

Written §21E notice to the utility sent (date): _____ Utility response received (date): _____

"Satisfactory arrangements" agreed — describe (de-energize / cover-up / relocate / clearance held): _____

Yellow 5"×7" "SIX FEET" sign in cab: □ On outside of rig: □ Verified legible at 12 ft: □

3.5 Underground Utilities

3.5.1 The rule. No ESC auger, casing, hand tool or excavator touches the ground until underground facilities have been located, marked and — where required by §3.5.5 — physically exposed. Per 29 CFR 1926.651(b)(1): the estimated location of utility installations (sewer, telephone, fuel, electric, water lines, or any other underground installations that may reasonably be expected to be encountered) **shall be determined before opening an excavation**. Per 1926.651(b)(2), utility companies shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. Per 1926.651(b)(3), **when excavation operations approach the estimated location of underground installations, the exact location shall be determined by safe and acceptable means.** Per 1926.651(b)(4), while the excavation is open, underground installations shall be **protected, supported or removed** as necessary to safeguard employees.

3.5.2 Massachusetts Dig Safe — a statutory duty, not a courtesy. Excavation in Massachusetts is governed by **M.G.L. c. 82 §§ 40–40E** and **220 CMR 99.00**. ESC will:

1. **Call Dig Safe at 811 (or 1-888-DIG-SAFE / 1-888-344-7233 / (888) 344-7233), or file online**, before any excavation, drilling or blasting.
2. **Provide the statutory advance notice.** The notice must be given **at least 72 hours — excluding Saturdays, Sundays and legal holidays — and not more than 30 days before the excavation is to be made** (M.G.L. c. 82 § 40A; 220 CMR 99.04(1)). **Excavation may not commence within 72 hours after notification** (220 CMR 99.07(1)).

> **"72 hours excluding weekends and holidays" is NOT "3 calendar days."** Call Monday morning → the earliest ESC may dig is Thursday morning. Call Thursday → the weekend does not count → Tuesday at the earliest. A legal holiday pushes it further. ESC schedules the call against a calendar, not against a feeling.

1. **Know the ticket life — it is a different rule that happens to share a number.** A Dig Safe ticket is valid for **30 calendar days from the date of notification, and only so long as the markings remain clear and discernible** (220 CMR 99.07(2)). The "not more than 30 days" in §40A is an outer bound on *how early you may call*; the 30 days in 99.07(2) is *how long the ticket lives*. **ESC renews the ticket by calling in a fresh notice at least 72 business hours before day 30 expires, so there is no gap. Obliterated marks void the ticket even inside the 30 days.**
2. **Premark** the proposed excavation area in **white** — paint on pavement, or white stakes/markings on unpaved surfaces — **before** giving notice (220 CMR 99.03(1); M.G.L. c. 82 §40). Not more than 500 feet of proposed excavation per notice. On this project that means premarking each of the 11 pier locations in white (36-in circles), plus the rig access/setup path and the spoil-handling area, before the call. Where white marks would interfere with traffic or pedestrian control, **pink may be used — and ESC must tell the Dig Safe Center that the notice used pink** (220 CMR 99.03(2)).
3. Obtain and record the **Dig Safe ticket number**, the date, and the list of member companies notified:

Dig Safe ticket no.: _____ Date/time called: _____ Called by: _____

Ticket valid through (30 calendar days): _____ Renewal notice due (72 business hrs before expiry): _____

Excavator on ticket: _____ Member companies notified (list attached): □

1. Confirm that **every** notified member utility has responded — either by marking, or by a clear "no facilities" response. **A company with no facilities to mark is required to tell the excavator so (220 CMR 99.06(10)); a "clear" response is an answer, not silence — get it in writing on the ticket. An unresponded utility is not a cleared utility. ESC does not dig on a partial locate.**
2. **Separately notify non-member and private facility owners.** Dig Safe is a **notification center only — it does not mark lines**, and member companies mark **only their own** facilities, generally up to the meter. Dig Safe does **not** cover privately owned laterals, service lines, site lighting, generator feeders and fuel lines, irrigation, fire alarm, security and card-access conduit, emergency-dispatch and radio duct banks, signal-preemption loops, septic systems, or anything else behind the meter. ESC will require the owner/GC to identify and mark, or arrange private locating for, all private facilities in the work area, and will obtain site as-builts in writing. **A verbal "there's nothing there" is worthless.**
3. **Maintain the marks — this is ESC's job, not the utility's.** 220 CMR 99.07(4) makes **the excavator** responsible for maintaining the markings, placing offset marks, or requesting a remark. Rig tracks, spoil piles and rain destroy marks. If markings are destroyed, obscured or become unreliable, or if the ticket expires, **stop and re-notify Dig Safe — and suspend excavation in that area for 24 hours after requesting a remark** (220 CMR 99.06(6); 99.07(5)).
4. **Unmarked facility found → SUSPEND.** 220 CMR 99.07(6): the excavator shall suspend excavating until notifying the Dig Safe Center, and shall protect the facility. **Abandoned facility found → do not remove it** without authorization and direction from the company that owns it (220 CMR 99.07(7)).
5. Record all of the above on the Utility Clearance Form (Appendix 3-E), signed by the Competent Person.

3.5.2a The legal reason ESC never skips the ticket. M.G.L. c. 82 §40C: making an excavation **without the notice required by §40A**, where that excavation damages a pipe, main, wire or conduit **or its protective coating**, is **prima facie evidence in any legal or administrative proceeding that the damage was caused by the negligence of the excavator.** No ticket = ESC is presumed negligent. Penalties under §40E run **$1,000 for a first offense** and **not less than $5,000 nor more than $10,000** for a subsequent offense within 12 consecutive months — and violations involving a **natural gas pipeline facility** are penalized on the higher scale of M.G.L. c. 164 §105A, not §40E.

3.5.3 Standard color code — the Massachusetts list, not the generic one. Employees are trained to recognize the marking colors as defined by **220 CMR 99.02**, which is the list that binds in Massachusetts:

Color	Facility (220 CMR 99.02)
White	Premarks of proposed excavation
Pink	Premarks per 220 CMR 99.03(2), temporary survey marks, or marks used to distinguish from other color-coded marks
Red	Electric power lines, cables, conduit or light cables
Yellow	Gas, oil, petroleum, steam or other gaseous materials
Orange	Communications cables or conduit, alarm or signal lines
Blue	Water, irrigation and slurry lines
Green	Sewer and drain lines
Purple	Reclaimed water such as used for irrigation or slurry lines

> **Two differences from the national APWA card that ESC crews must know.** (1) In Massachusetts **blue is not "potable water only"** — it covers water, irrigation and slurry, and it **overlaps with purple**. **Never infer a facility's contents from its color alone; confirm with the owning company.** (2) In Massachusetts **pink may be a lawful PRE-MARK**, not just a survey mark. Do not assume pink means "surveyor."

> **The paint mark is the CENTER LINE of the facility, not its edge** (220 CMR 99.02, center-line method). It tells you nothing about the facility's true width or its lateral wander. Marking extends at least 15 feet beyond the boundaries of the premarked area (220 CMR 99.06(5)), and marks indicate the width where greater than 2 inches (99.06(3)).

3.5.4 Geophysical location (GPR / EM). Locate marks give an *estimated* position and give **no depth**. Where shafts are located in or near a utility corridor, in paved areas with unknown backfilled trenches, or on a site with known conflicts, ESC will engage a **private subsurface utility locating firm** to perform **ground-penetrating radar (GPR) and electromagnetic (EM) locating** over each shaft location and to mark the results.

ESC's private locating firm for this project is **GPRS (Ground Penetrating Radar Systems), Boston — 617-448-8098, massachusettsinfo@gprsinc.com**, engaged to sweep all 11 pier locations and the rig access/setup path with electromagnetic locating and GPR before the auger turns.

Locating firm: GPRS (Boston) — 617-448-8098 Sweep performed (date): _____

Locator's report no.: _____ Report on file with the Utility Clearance Form: □

Quality level ESC will achieve, and why it is not negotiable. Under **ASCE/UESI/CI 38-22**, a records-and-interviews answer is **QL-D**, records plus surveyed surface appurtenances is **QL-C**, and a surface-geophysics sweep (EM + GPR) giving **horizontal position with no depth** is **QL-B**. Positive physical exposure of the facility by vacuum excavation, with horizontal **and vertical** position measured, is **QL-A**.

What ESC has	ASCE 38 level	Good enough to drill a 36-in pier?
Town as-builts, or "the maintenance guy says there's nothing there"	**QL-D**	**NO**
As-builts plus a survey of visible manholes and valve boxes	**QL-C**	**NO**
Dig Safe 811 marks plus the GPRS EM/GPR sweep	**QL-B**	**NOT ALONE** at a pier location
Vacuum test hole physically exposing the facility at the pier	**QL-A**	**YES — this is the standard ESC meets at every pier with a facility nearby**

> **THE QL-B TRAP.** A QL-B locate gives horizontal position with **no depth**. A 36-in auger can pass *beside* a surface mark and still shear the line at depth — and EM locating **physically cannot detect** a non-conductive line (poly gas service, PVC water or irrigation, plastic conduit) that has no tracer wire. **QL-B is not clearance. Only QL-A — physical exposure — is clearance.**

ASCE 38 quality level achieved across the work area: □ QL-B At each pier with a facility indicated: □ QL-A

GPR is a screening tool, not a guarantee. It does not see everything (non-metallic pipe, deep facilities, saturated or clay soil attenuate the signal). **GPR does not replace positive exposure.**

3.5.5 Positive location — soft-dig / vacuum excavation and hand-dig. 29 CFR 1926.651(b)(3) requires the **exact** location be determined by **safe and acceptable means** as excavation approaches the estimated location. ESC's method:

1. **Establish the safety zone — Massachusetts has its own statutory definition, and this is it.** M.G.L. c. 82 §40 defines the **"safety zone"** (Massachusetts's name for the tolerance zone) as "a zone designated on the surface by the use of standard color-coded markings which contains **the width of the facilities plus not more than 18 inches on each side.**" Because a marked line is a **center line** and tells you nothing about the facility's true width or its lateral wander, **ESC works the conservative reading of the statute: the safety zone extends 18 inches horizontally beyond each OUTER EDGE of the facility, measured from the marked center line plus half the facility width — and ESC will not put an auger inside it.** The zone runs from the surface to below the facility.
2. **Within the safety zone, no mechanical excavation. Period.** No auger. No excavator bucket. No breaker. **220 CMR 99.07(3) requires non-mechanical means when excavating in close proximity to an underground facility, and permits mechanical equipment ONLY for the initial penetration of pavement, rock or similar material — after which non-mechanical means must be used.** An auger is mechanical means. **It may not be turned inside the safety zone.** ***(Note: §40C attaches the qualifier "when such facilities are to be exposed"; 220 CMR 99.07(3) contains no such qualifier and applies whenever excavating in close proximity. ESC follows the broader regulation.*** *It is both the safer reading and the enforceable one, since the DPU enforces 220 CMR 99.00.)*
3. **Positive location is by vacuum excavation ("soft dig") or careful hand-digging** with insulated, non-conductive-handled tools, exposing the facility so it can be seen and its depth measured. **Massachusetts statutorily defines air vacuum and air blowing as "non-mechanical means"** (M.G.L. c. 82 §40: "excavation using any device or tool manipulated by human power, **including air vacuum, air blowing or similar methods of excavation** designed to minimize direct contact with utilities"). **Vacuum potholing therefore SATISFIES the non-mechanical-means requirement inside the safety zone — ESC does not have to hand-shovel a 36-in pier location; it may vacuum-excavate it.** Air-knife/hydro-vacuum excavation is ESC's preferred method because it is the least likely to damage a coated pipe or a direct-buried cable.
4. Where a facility is exposed within the footprint of a shaft, **the shaft is not drilled** until the facility is protected, supported, relocated or removed as required by 29 CFR 1926.651(b)(4) and the design engineer has approved the resolution in writing.
5. Every ESC shaft location on a site with known or suspected utility conflicts will be **soft-dug to a minimum depth of 5 feet — and deeper where required to expose and pass below the deepest facility indicated at that location** — before the auger turns. This is a bid assumption and is priced. The depth actually achieved at each pier is recorded:

Pier: _____ Soft-dig depth achieved: _____ ft Deepest facility exposed at: _____ ft Cleared to auger by: _____ Date: _____

1. **Known conflicts requiring soft-dig — listed per project.** The Competent Person lists, before mobilization, every pier location at which a buried facility is known or suspected, and every protected feature (leach field, stormwater basin, wetland, drainage structure) excluded from equipment travel, spoil placement and laydown. **Every listed pier location WILL be soft-dug / vacuum-excavated before the auger turns**, and no mechanical excavation occurs at any of them until each facility is positively exposed, its depth measured, and its resolution approved in writing by the design engineer.

Pier locations requiring soft-dig: _____ Facilities indicated: _____

Protected exclusion areas (no travel, no spoil, no laydown, no washout): _____

1. Exposed facilities are **supported and protected** (bridging, slings, barricades) and **never** used as a step, a ladder, a lever or a tie-off anchor.

3.5.6 Overhead-and-underground together. ESC company rule: prior to any drilling operation, ALL utilities — overhead and underground — are located. Both surveys are completed and documented before the first shaft, and both go into the site-specific plan (§3.1.1). The two duties come from two different standards and neither substitutes for the other: **29 CFR 1926.651(b)(1)–(2)** for the underground facilities (determine their approximate location before opening the excavation, by the utility's locate service), and **29 CFR 1926.416(a)(3)** for the energized overhead circuits (ascertain, before work begins, by inquiry, direct observation or instruments, whether any energized circuit is so located that the work may bring a person, tool or machine into contact with it).

3.5.7 UTILITY STRIKE — IMMEDIATE ACTIONS. If any ESC tool, auger, casing or equipment contacts, damages or nicks an underground facility — **even if it appears minor, even a scrape on the coating** — the following applies:

All strikes:

1. **STOP WORK. Do not attempt to move the tool, back out the auger, or "finish the hole."** Movement turns a nick into a rupture.
2. **Evacuate personnel upwind and uphill.** Establish an exclusion zone.
3. **Notify 911, the facility owner, the GC and the ESC Competent Person immediately.** Then notify Dig Safe (damage reporting per M.G.L. c. 82 §40E and 220 CMR 99.00).
4. **Do not repair, backfill, or conceal the damage.** Only the facility owner repairs its facility.
5. Preserve the scene. Photograph. Record the Dig Safe ticket number, the marks, the tool position and depth. Complete the ESC Incident Report.

Natural gas / petroleum line:

- **Evacuate immediately, upwind, and expand the zone.** Gas is heavier or lighter than air depending on the product; assume the worst.
- **Eliminate all ignition sources.** Shut down the rig **only if it can be done without delay and without re-entering the cloud** — otherwise leave it running and get out; a starter or an ignition switch is an ignition source. Do not use cell phones, radios or vehicles within the cloud.
- **Call 911 first.** Then the gas utility's 24-hour emergency line, as recorded on the site emergency card. (Across much of Massachusetts the gas utility is **National Grid — gas emergency 1-800-233-5325**; National Grid's own instruction: "*If you smell gas anywhere … go outside and call 1-800-233-5325 or 911 immediately. Do not assume that someone else has already reported the emergency.*"). **Call from a safe distance, upwind — a phone is an ignition source.** Calling 911 for a gas escape is not discretionary: 220 CMR 99.07(8)(a) requires it.
- Do not return until the utility and the fire department declare the area safe.

Electric cable:

- **Assume the cable and the surrounding ground are energized.** Do not touch the tool, the rig, the casing or the ground near it.
- If you are on or in contact with the equipment: **stay put** and follow §3.4.14 (stay in the cab; if you must leave, jump clear, feet together, shuffle away).
- Call **911** and then the electric utility, as recorded on the site emergency card. (In eastern Massachusetts this is commonly **Eversource Energy — outage and downed-wire line 1-800-592-2000**.) Ask the utility to **de-energize the circuit and disable automatic reclosing**. **Only the utility de-energizes** — and a circuit that goes dead can be re-energized automatically by a recloser without warning.

Water / sewer: Stop work; notify the owner; control flooding and scour; watch for undermining of the rig's working platform (a broken water main under a drill rig is a tipping hazard, not just a plumbing problem) and move the rig to firm ground if it can be done safely.

Communications / fiber: Stop; do not look into a severed fiber end (laser hazard); notify the owner.

3.5.8 Contaminated soil / unknown buried objects. If drilling encounters unexpected buried structures, drums, tanks, staining, sheen or odor, **work stops** and the Competent Person notifies the GC and the owner. ESC does not proceed on an unknown. Air monitoring and a HAZWOPER-qualified response are the owner's/GC's responsibility unless separately contracted.

3.6 Rotating Auger, Kelly Bar and Drive — Caught-In / Entanglement

3.6.1 This is the classic fatality. A rotating auger, a rotating kelly bar, and a rotating drive head do not stop for a hand, a sleeve, a glove, a hose, a tag line or a person. There is **no reaction time**. A worker who touches a turning flight is wrapped around the stem before he can let go. Every rule below is written in blood elsewhere in this industry, and ESC treats them as absolute.

3.6.2 THE ABSOLUTE RULES.

> 1. **NEVER approach, touch, guide, steady, clean, or reach toward a turning auger, kelly bar, casing, drive head, or any rotating component — for any reason, for any duration, ever.** 2. **NEVER use a hand, foot, shovel, bar, chain, hose or tag line to remove spoil, mud, rock or debris from a turning auger.** 3. **The auger is cleaned only when the rig is SHUT DOWN, the rotation is stopped and cannot be started, the tool is landed or securely supported so it cannot fall or swing, and the operator is out of the seat or the controls are locked.** 4. **No worker is permitted under any suspended load or under the auger during a drilled-shaft installation. Ever. This is an ESC absolute rule and it applies to every load on the site — on the drill rig's auxiliary winch, or on any machine furnished by others.** 5. **No worker enters the RAZ / spin-off arc while the auger is spinning off.** 6. **If you can touch it, it must not be able to turn. If it can turn, you must not be able to touch it.**

3.6.3 Spin-off. Spinning spoil off the auger flings soil, rock, cobbles and water tens of feet. Before spin-off:

- The operator confirms the spin-off arc is **clear of all personnel, vehicles, the public and adjacent trades**;
- The spin-off arc is inside the barricaded RAZ (§3.3.7);
- The spoil lands in the designated spoil area (§3.11), not on a travel lane, a sidewalk, a hydrant, an adjacent trade's work or a parked car;
- Where spin-off cannot be safely contained, the auger is **cleaned by tooling with the rig shut down**, or a cleanout bucket is used instead.

3.6.4 Auger cleaning procedure (the only permitted procedure).

1. Operator lands the auger on the ground or on the cleaning stand, or the tool is positively supported so it cannot fall, swing or rotate.
2. Operator disengages rotation, sets the controls to neutral, applies any parking/locking device, **shuts the rig down**, and — where the machine permits — removes the key.
3. Operator confirms verbally and visually with the ground crew: **"Rig is down, auger is dead."**
4. Only then may a worker approach, and only from the side, never from beneath.
5. Cleaning is done with a **long-handled scraper, hoe or spade**, never a bare hand, never a gloved hand between the flights.
6. Cuttings are cleaned **wet** (see §3.8 and **Part 2, Section 2.3**); **compressed air is never used** to blow off the auger, the tooling or the deck (29 CFR 1926.1153(f)(2)), and **dry brushing/sweeping is prohibited** (1926.1153(f)(1)).
7. When cleaning is complete, all personnel step clear and confirm clear before the operator restarts.

3.6.5 Clothing, gloves, jewelry and hair. Around a rotating drive:

- **No loose clothing.** Sleeves buttoned or short. No open jackets, no hoodie drawstrings, no loose hi-vis vest tails, no untucked shirts, no ties, no scarves, no towels around the neck.
- **No jewelry.** No rings, no watches, no bracelets, no chains.
- **Long hair tied up and contained** under the hard hat.
- **Gloves are removed** near any rotating shaft or pinch point unless a specific hazard (heat, laceration, chemical) requires them and the worker is clear of the rotating component. A glove is a hook.
- **No lanyards, no radio straps, no ID badge lanyards** hanging loose near the drive.

3.6.6 Guards. All manufacturer-installed guards over rotating components, drive chains, sheaves and pinch points shall be **in place and functional**. A missing or defeated guard takes the rig **out of service**. Guards are checked on every shift inspection (§3.3.8).

3.6.7 Tooling changeout and lifting tooling. Changing augers, core barrels, rock augers, cleanout buckets, chisels and kelly extensions is a planned, briefed operation:

1. Rig shut down or in a defined safe state per the manufacturer's manual before any worker approaches the tool.
2. The tool is **positively supported** — landed on the ground, on blocking, or in a tool stand — before pins are pulled. **Never rely on hydraulics alone to hold a tool while a worker's hands are in the connection.**
3. **Hands out of the line of fire.** Use drift pins, hammer wrenches and pull-through bars — never fingers — to align holes. A 36-in rock auger closing on a hand takes the hand.
4. Pins are retained (keepers, clips, safety pins) and inspected.
5. Rigging is rated for the tool weight, inspected before use (29 CFR 1926.251), and attached to designed lift points only.
6. **Nobody stands under, straddles, or reaches beneath a suspended tool** (§3.6.2, absolute rule 4). Tag lines control the tool; tag lines are **non-conductive** near overhead lines (§3.4.8).
7. **Tool weights are known before the tool is picked — never estimated by eye. Read the weight of each tool from the tooling manufacturer's data plate, tag or catalogue sheet, weigh it if the marking is missing or illegible, and post the weights in the cab alongside the rig's auxiliary-winch chart.** An unmarked, unweighed tool is not picked. The weights in service on this project are recorded on the Lift Plan (Appendix 3-K) and on the Daily Drill Rig Inspection form:

Auger: _____ lb Rock auger: _____ lb Core barrel: _____ lb

Cleanout bucket: _____ lb Chisel: _____ lb Kelly extension: _____ lb

Weights taken from: □ manufacturer's data plate/tag □ manufacturer's catalogue sheet □ weighed on site — by: _____ Date: _____

1. The auxiliary winch is used only within the manufacturer's rated capacity and load chart; a tool whose weight approaches or exceeds that limit is not picked, and the winch line is never multi-parted to gain capacity without the equipment manufacturer's written authorization (A10.23 §12.12; §3.7.3).

3.6.8 Kelly bar hazards. The kelly bar telescopes and can drop with great force. Employees stay clear of the kelly's path at all times. The kelly is never used as a lever, a pry, a hammer or a lifting hook. Kelly locks, retaining pins and stops are inspected each shift. A kelly that is bent, cracked, or has a damaged locking mechanism is taken out of service.

3.6.9 Hands off during drilling. During drilling: **no person touches the rig, the casing, the kelly, the tooling, or the drill string.** No person is between the mast and the shaft. No person is on the deck. The ground crew stands **outside the swing radius and outside the spin-off arc**, in view of the operator. (This is also the touch-potential rule at §3.4.12 — no one is in contact with the drill rig and the ground at the same time during drilling.)

3.6.10 Communication. Drilling is loud. The rig operator and the ground crew agree on hand signals **before** work starts, and use two-way radios where line of sight or noise makes hand signals unreliable. **If the operator loses sight of a ground worker, the operator stops.**

3.7 Materials Handling, Rigging, Casing and the Auxiliary Winch

3.7.1 The rig is not a crane. This is the single most important sentence in this section. A foundation drill rig has a **fixed-length mast** whose function is to contain and guide the rotating kelly in a vertical position — **not** to serve as a load-positioning system the way a crane boom does. The working radius is not variable. The auxiliary winch line generally cannot be multi-parted. Using the rig as a crane is how rigs tip over.

3.7.2 Auxiliary winch — the limits. Per ANSI/ASSP A10.23:

- **§12.11:** "The use of an auxiliary winch on dedicated, self-contained, hydraulic and/or friction clutch/friction brake drilled shaft installation equipment shall be **within the limits established by the equipment manufacturer**."
- **§12.12:** "The use of a **multi-part load block** to increase the capacity of an auxiliary winch line on a dedicated, self-contained, hydraulic and/or friction clutch/friction brake drill rig is **PROHIBITED without written authorization from the equipment manufacturer**."
- **§12.13:** Determination of safe lifting capacities of auxiliary hoists on **mobile cranes** used for drilled-shaft installations shall include the **suspended weight of all drill equipment attachments**.

3.7.3 ESC's auxiliary winch rules.

> - The auxiliary winch is used **ONLY** for lifting, supporting and lowering the equipment required for the drilling/excavating operation and for casting: drilling tooling, casing, chisels, rope grabs, reinforcing cages, tremie pipe and casting equipment — **strictly within the manufacturer's chart**. - **NO multi-part blocking** of the winch line without written manufacturer authorization. - **NO offloading of material from trucks or trailers with the rig.** - **NO general material handling, no lifting of other trades' material, no "quick pick" of anything.** - **NO travel with a suspended load.** - **Tracks fully extended; machine level within the manufacturer's tolerance; mast inclination within the manufacturer's limit.** - The rig's load/range chart and any cab placard limitations are posted in the cab and honored. - Where the manufacturer permits the auxiliary winch to lift anything other than drilling tooling, a **written lift plan** is prepared and followed, and the activity appears in the JHA.

3.7.4 Cages, casing and tremie are set on the drill rig's auxiliary winch. ESC brings only the drill rig and does its own lifting with the **drill rig's auxiliary winch**, within the manufacturer's rated capacity and load chart (**A10.23 §12.11**). Reinforcing cages, casing sections, soldier piles and tremie pipe are lifted and set **straight into the shaft, near-vertical**, on that winch — never on a machine ESC does not bring. The winch line is **never multi-parted to gain capacity without the equipment manufacturer's written authorization (§12.12), never used to offload a trailer, never used to travel with a suspended load, and never used to lift a load out at a radius** — lifting at radius is the single most common drill-rig tipping cause and is prohibited (§3.7.1). ESC provides the qualified rigger and qualified signal person for placing the cage in its shaft.

IMPORTANT: Because ESC's lifting is done on the drill rig itself, every cage and casing set is also a rig-stability event: the machine is level within the manufacturer's tolerance, tracks fully extended, matted, and the mast within limits, with the load kept within the manufacturer's chart (§3.3.4, §3.7.3). The dedicated-drilling-rig exclusion at **29 CFR 1926.1400(c)(11)** relieves none of this — ESC holds the rig to the manufacturer's manual, to A10.23, and to the power-line regime it has voluntarily adopted (§3.4.2), and every cage or casing lift is performed under a **written lift plan** (Appendix 3-K).

3.7.5 Reinforcing cage handling. ESC company rule: the reinforcing cage and its lift point(s) are designed by a registered Professional Engineer to withstand the forces applied when the cage is lifted from horizontal to vertical, and the fabricator assembles the cage in accordance with that design. A cage is a slender, flexible assembly of bar and tie wire; the moment it is picked from horizontal it wants to sag, buckle and shed bars, and the forces at the pick points bear no relation to its dead weight lying flat. **The lift is an engineering problem, and ESC treats it as one.**

- **Cage lift design.** The reinforcing cage and its lift points are **designed and stamped by a Massachusetts-registered Professional Engineer engaged by ESC for that purpose, before the first cage is picked.** The engineer's name, license number and seal appear on the stamped detail itself; the stamped detail is kept in the site file and on the rig, and a copy is transmitted to the project constructor. **ESC does not pick a cage on an unstamped design.**

Stamped cage lift design in the site file — dated: _____ Transmitted to the GC on: _____

- **Cage weight is computed from the approved cage schedule for the project — bar sizes, bar count, spiral size and pitch, and cage length — and is posted in the cab before the first pick. A cage of unknown weight is not picked.**

Cage configuration: _____ Computed cage weight: _____ lb Posted in cab by: _____ Date: _____

- **Rigging configuration.** The pick points, and whether a spreader bar or a strongback is required to lift the cage from horizontal to vertical without buckling it, are **taken from the stamped cage lift design — not chosen in the field.** The configuration actually rigged is confirmed against that design before the pick and recorded:

Pick points as shown on the stamped design: □ Spreader bar: □ Strongback: □ Neither required by the design: □

Rigging configuration verified against the stamped design by: _____ Date: _____

Rules: only rigging of adequate capacity and configuration is used (29 CFR 1926.251). Cages are supported so they cannot roll while being rigged. **No one is under or inside the cage during the pick.** Tag lines control the cage. The cage is landed in the shaft under the control of the signal person, with hands clear of the collar. Cages are never climbed. Cage hangers/supports carry the full cage load until concrete is placed.

3.7.6 Casing — installation. Temporary casing is used to control groundwater, caving soils, boulders and the soil/rock interface. Casing handling is a **high-risk lift**:

1. **Casing weights are known and posted before the first section is picked. Take the outside diameter, wall thickness and length from the casing supplier's data sheet or mill certificate, compute the weight per section from them, and post the figure in the cab next to the auxiliary-winch chart and on the Lift Plan (Appendix 3-K).** A casing section of unknown weight is not picked. (Where the geotechnical report of record shows groundwater within shaft depth, temporary casing is presumed likely and is planned for before mobilization.)

Casing OD: _____ in Wall: _____ in Section length: _____ ft Weight per section: _____ lb

Source of the figures (supplier data sheet / mill certificate): _____ Posted in cab by: _____ Date: _____

1. Casing is picked with rated rigging from designed lift points or a proper casing clamp/lifting eye. **Never a chain choked around a casing with no capacity calculation.**
2. **Mats under the tracks for all casing handling and casing extraction** (§3.3.4). Casing pull is the rig's most unstable moment: the winch or the drive is holding heavy steel at radius, and the extraction force reacts through the tracks.
3. No worker's hands are between casing sections, between casing and the collar, or under a suspended casing section. Bolted/pinned casing joints are made up with drift pins and hammer wrenches — never fingers.
4. A dropped casing section falls into the hole and pinches or crushes anyone at the collar. **All personnel are clear of the collar whenever casing is suspended.**
5. **Temporary casing is advanced by the drill rig itself** — by its rotary drive and crowd — and its sections are handled on the drill rig's auxiliary winch within the manufacturer's chart; it is **not** driven with a separate hammer. Where percussive rock work is performed near the occupied station, the noise exposure (§3.8.3) and the ground-vibration hazard to adjacent structures/utilities are evaluated (§3.8.5).

3.7.7 Casing — extraction. Casing extraction is governed by the shaft design, by the rig manufacturer's stated extraction limits, and by the following ESC rules — it is the single most unstable operation the rig performs:

1. Casing extraction is planned and briefed. It is done **while the concrete in the shaft is still fluid and workable**, with the concrete head maintained above the bottom of the casing at all times as required by the shaft design, to prevent necking, soil intrusion and shaft defects.
2. The rig is level, matted, tracks extended, mast within limits. **Extraction force is a tipping force.**
3. The extraction load is monitored. **If the casing binds or refuses, STOP.** Do not increase force beyond the manufacturer's limit, do not "shock" the casing, do not attach the winch line to a fixed object and try to drive the machine away. A bound casing is an engineering problem, not a horsepower problem. Notify the Competent Person and the design engineer.
4. **All personnel are clear of the collar and outside the swing radius during extraction.** A casing that breaks free comes up fast and can whip.
5. Extracted casing is landed, cleaned wet, blocked and chocked so it cannot roll.
6. Casing that is deformed, cracked, badly worn, or has damaged joints is removed from service.

3.7.8 Rigging generally. All slings, shackles, hooks, hoist rings and wire rope are inspected before each use and periodically per 29 CFR 1926.251, are rated for the load, and are removed from service and destroyed when damaged. Hooks have functioning safety latches. **Rigging is never wrapped around a rotating component.** Hands and bodies are kept **out of the line of fire** of any load under tension.

3.7.9 Pressurized lines and hoses. Per 29 CFR 1926.302 (power-operated hand tools / pneumatic) and the pressurized-line principles of 29 CFR 1926.803, applied by ESC to the rig's hydraulics as company policy: all hydraulic and air hoses, couplings and fittings are inspected each shift; whip-checks / safety cables are installed on all compressed-air hose connections; hoses are routed out of travel paths and pinch points; **no hydraulic line is bled, cracked or disconnected under pressure**; and a **pinhole hydraulic leak is never checked with a hand** — hydraulic fluid injection injuries are surgical emergencies. Use cardboard or a mirror. Report any suspected injection injury immediately; it is a **medical emergency even if it looks like a pinprick.**

3.8 Rock Coring, DTH and Socketing — Silica, Noise, Flying Rock, Vibration

3.8.1 Respirable crystalline silica. Drilling and coring rock, socketing into bedrock, hoe-ramming boulders, cutting and chipping concrete, and handling dry cuttings all generate **respirable crystalline silica** and are covered by **29 CFR 1926.1153**. Granite and gneiss — the bedrock of eastern Massachusetts — are high in quartz. ESC's full compliance program is **Part 2, Section 2.3 — Written Silica Exposure Control Plan**, which is incorporated here by reference. The operational summary for the drilling crew:

1. The foundation drill rig is a **"vehicle-mounted drilling rig for rock and concrete"** under Table 1 entry **(ix)** of 29 CFR 1926.1153(c)(1). ESC will fully and properly implement **one** of the two Table 1 (ix) options:
   - **Option A:** Operator inside an **enclosed cab** meeting 29 CFR 1926.1153(c)(2)(iii)(A)–(F) — free of settled dust, working door seals and gaskets, **positive pressure via continuous fresh-air delivery**, intake air filtered to **95% efficient in the 0.3–10.0 µm range (MERV-16 or better)**, and working heating/cooling — **PLUS water applied for dust suppression at the drill bit**, because the laborer at the hole is not in the cab and must be protected. The cab is the enclosed cab of the drill rig. **Read the cab filter part number and its rated efficiency from the rig's operator's manual and from the filter manufacturer's marking, confirm the filter meets the 95%-at-0.3–10.0 µm criterion, and record the filter and its change date on the Daily Drill Rig Inspection form (Appendix 3-A). Change the filter on the manufacturer's interval or sooner, and do not run the cab option on an unrated or overdue filter.**

Rig: the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization Serial no.: _____

Cab filter part no.: _____ Rated efficiency / MERV: _____ Meets 95% @ 0.3–10.0 µm: □

Filter last changed: _____ Next change due: _____ Checked by: _____

   - **Option B:** A **close-capture hood or shroud around the drill bit feeding a dust collection system, with a low-flow water spray wetting the dust at the collector's discharge point.**

With either option fully implemented, **Table 1 (ix) requires NO respirator, regardless of task duration.**

1. **KEEP IT WET.** Maintain water in the cased shaft; use water injection or a wet flush during rock socketing; use a rock auger or core barrel rather than a dry air-flush percussion tool wherever the design permits. Water flow must be **"sufficient to minimize release of visible dust"** per 1926.1153(c)(2)(ii). **VISIBLE DUST MEANS THE CONTROL HAS FAILED — STOP AND ADJUST.** The Competent Person has stop-work authority for visible dust.
2. **THE AIR-FLUSH GAP — stated honestly.** A **down-the-hole (DTH) hammer or percussion rock drill run on AIR FLUSH with no water and no close-capture shroud/collector is NOT a fully and properly implemented Table 1 control.** Both Table 1 (ix) options require water. Likewise, a rig-mounted core drill run dry with a vacuum instead of water falls **out of** Table 1 entry (vi). If ESC uses such a method, that task drops to **29 CFR 1926.1153(d)** and ESC must: comply with the 50 µg/m³ PEL; perform an exposure assessment under (d)(2) (performance option or scheduled monitoring option); implement all feasible engineering and work-practice controls to the lowest feasible level; and **supply at minimum APF 10 respirators, under a full 29 CFR 1910.134 program, pending data.**

> **ESC PREFERENCE: WET METHODS. ESC will not run dry air-flush rock drilling without a written paragraph (d) exposure assessment and respiratory protection in place first.** Where a paragraph (d) exposure assessment is required, ESC engages its qualified industrial-hygiene provider (§3.8.3) to take **personal breathing-zone samples with a respirable-dust cyclone sampler**, analyzed by an **accredited laboratory** using the sampling and analytical methods the silica standard requires — **29 CFR 1926.1153(d)(2)**. ESC does not self-sample and does not estimate an exposure.

1. **Wet the cuttings and the spoil pile** as spoil comes out of the hole and before it is loaded (Table 1 (xviii)).
2. **Prohibited, always:** dry sweeping or dry brushing of cuttings, rock dust or slurry residue (1926.1153(f)(1)); using **compressed air** to clean the auger, the tooling, the deck, drilled holes, surfaces or clothing (1926.1153(f)(2)).
3. **The 4-hour aggregation rule.** Under 1926.1153(c)(3), if one employee's **combined** Table 1 task time in a shift (sawing + chipping + coring + grinding) exceeds four hours, the **">4 hr" respirator column applies to every one of those tasks for the whole task** — not just the overage. ESC keeps a **daily silica task-duration log per employee** and sequences work to stay under four hours where practical.

4. ESC will keep fit-tested crew and half-mask P100 respirators available on site as the fallback for any day chipping or handheld sawing runs long. **A respirator cannot be arranged the morning of** — medical evaluation must precede fit testing and use (29 CFR 1910.134).

3.8.2 ESC's no-man-entry policy removes the worst-case silica scenario. Because ESC personnel never enter a shaft (§3.10), the highest-exposure silica scenario in caisson work — a worker inside the bore — does not exist at ESC.

3.8.3 Noise. Drill rigs, DTH hammers, hoe-rams, compressors and concrete pumps routinely exceed 90 dBA. Per **29 CFR 1926.52** and **29 CFR 1926.101**:

1. Where employee noise exposure equals or exceeds an 8-hour TWA of **90 dBA** (or the equivalent dose in Table D-2 of 1926.52), **feasible administrative or engineering controls shall be utilized**; where such controls fail to reduce sound levels within the limits, **personal protective equipment shall be provided and used** to reduce sound levels within the levels of the table.
2. In all cases where the sound levels exceed the values shown, **a continuing, effective hearing conservation program shall be administered** (29 CFR 1926.52(d)(1)).
3. **ESC's practical rule: hearing protection is mandatory for every person inside the RAZ whenever the rig, a DTH hammer, a hoe-ram or a compressor is running.** Plugs or muffs; dual protection (plugs + muffs) for DTH hammering and hoe-ramming.
4. **Noise dosimetry.** Where an employee's exposure is uncertain — DTH hammering, hoe-ramming, extended compressor running — ESC will conduct **personal noise dosimetry** through a qualified industrial-hygiene provider and record the result. ESC's IH provider is **EH&E (Environmental Health & Engineering, Inc.), 180 Wells Avenue, Suite 200, Newton, MA 02459 — 781-247-4300**. Dosimetry results are kept with the exposure records:

Task monitored: _____ Dosimetry date: _____ Result (8-hr TWA, dBA): _____ Provider: _____

1. **Hearing conservation.** Where the sound levels of 29 CFR 1926.52 Table D-2 are exceeded, affected employees are enrolled in a continuing, effective hearing conservation program — baseline and annual audiometric testing, training, and annual review. ESC's audiometric providers are **OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — 877-399-1698** (fixed clinic; audiograms, spirometry, chest X-ray and respirator fit testing in one visit) and, where a mobile unit is warranted, **Examinetics — 800-493-5377**. With a crew of ten or fewer, ESC's normal route is the fixed clinic.

Audiometric provider used: _____ Baseline audiogram date: _____ Next annual due: _____

1. Hearing protection must not defeat the ability to hear the emergency stop signal or the backup alarm; radios with hearing-protective headsets are provided where needed.

3.8.4 Flying rock, fragments and ejected material. Rock coring, DTH hammering, chiseling and hoe-ramming eject rock chips and steel fragments at high velocity, and a DTH hammer can eject material **out of the top of the hole** with air.

1. **Safety glasses meeting ANSI Z87.1 are minimum; a face shield over Z87.1 glasses (or Z87.1 goggles) is required** for chiseling, hoe-ramming, chipping, grinding, and any work at the collar during percussion drilling.
2. The **RAZ excludes all non-engaged personnel** from the ejection zone. Nobody looks into the hole during percussion drilling.
3. Where flying rock could leave the RAZ and reach the public, adjacent property, vehicles or an occupied building, **blast mats, plywood shields, screening or a deflector are installed**, and dusty/percussive work is scheduled for periods of lowest public exposure. In an active occupied facility parking lot, this is a bid assumption to be coordinated with the GC and the facility owner in writing.
4. Chisels and points are inspected for mushrooming and cracking; mushroomed tools are dressed or discarded.
5. **Nobody stands under a suspended chisel** (§3.6.2, absolute rule 4).

3.8.5 Vibration and adjacent structures. Drilled shafts are a **low-vibration** installation method — that is one of their advantages over driven piles — and the augering itself is not expected to require monitoring. Percussive rock work (DTH hammering, chiseling, hoe-ramming boulders) is different: it transmits real ground vibration. Where that work is adjacent to an occupied building, a utility, a masonry structure or a structure of concern — and ESC treats a building housing emergency dispatch, communications or other vibration-sensitive equipment as a structure of concern by default — ESC will require a **preconstruction condition survey** and, where the project specification or the structural/geotechnical engineer of record establishes a peak-particle-velocity limit, **vibration monitoring by seismograph against that limit.**

The PPV threshold is set by the project specification or by the engineer of record — ESC does not invent one and does not adopt a rule-of-thumb figure. ESC's standby vibration-monitoring firm is **Haley & Aldrich, Inc., 70 Blanchard Road, Suite 204, Burlington, MA 01803 — 617-886-7400**. **Threshold exceedance = stop and reassess.**

PPV limit in force: _____ in/sec Source of the limit (project spec / EOR letter): _____ Dated: _____

Monitoring firm: _____ Seismograph location(s): _____ Monitoring start date: _____

Preconstruction condition survey completed: _____ By: _____ Report on file: □

3.8.6 Boulders and obstructions. Boulder and obstruction removal by hoe-ram or excavator falls under 29 CFR 1926.1153 Table 1 entry **(xvii)** — operate the equipment **from within an enclosed cab**, and **when employees outside the cab are engaged in the task, apply water and/or dust suppressants** as necessary to minimize dust emissions. Struck-by and crush hazards from a swinging boulder in the auger or on the winch are controlled by the RAZ and by the "nobody under a suspended load" rule.

3.9 Open Shaft Protection

3.9.1 A drilled shaft is a "hole" the instant the auger breaks ground. 29 CFR 1926.500(b) defines a **hole** as "a gap or void **2 inches** or more in its least dimension, in a floor, roof, or other walking/working surface," and defines **"lower levels"** to expressly include excavations and pits. A 36-inch shaft is eighteen times the threshold. **There is no argument available that a shaft collar is not a hole, and the duty attaches at first spoil — not at six feet.**

3.9.2 TWO independent duties apply — both are cited, both are met.

(a) 29 CFR 1926.501(b)(4) — Holes.

- **(b)(4)(i):** Each employee on a walking/working surface shall be protected from **falling through holes** more than 6 feet above lower levels, by **personal fall arrest systems, covers, or guardrail systems** erected around such holes.
- **(b)(4)(ii):** Each employee on a walking/working surface shall be protected from **tripping in or stepping into or through holes by COVERS.**
- **(b)(4)(iii):** Each employee on a walking/working surface shall be protected from **objects falling through holes by COVERS.**

> **Note carefully:** (b)(4)(ii) and (b)(4)(iii) contain **no 6-foot trigger** and **no alternative to a cover.** A partially drilled 3-ft-deep shaft still legally requires a **cover** against step-in and against dropped objects. Guardrails and PFAS do not satisfy (ii) or (iii).

(b) 29 CFR 1926.501(b)(7)(ii) — Excavations. "Each employee at the edge of a well, pit, shaft, and similar excavation **6 feet or more in depth** shall be protected from falling by **guardrail systems, fences, barricades, or covers**."

> **ESC'S RULE, WHICH SATISFIES BOTH: COVER IT AND BARRICADE IT.**

3.9.3 Cover criteria — 29 CFR 1926.502(i). Read this before you cut a piece of plywood.

- **(i)(1) — THE ROADWAY / VEHICULAR AISLE TEST:** "Covers located in **roadways and vehicular aisles** shall be capable of supporting, without failure, at least **twice the maximum axle load of the largest vehicle expected to cross over the cover.**"
- **(i)(2) — ALL OTHER COVERS:** "shall be capable of supporting, without failure, at least **twice the weight of employees, equipment, and materials** that may be imposed on the cover at any one time."
- **(i)(3):** "All covers shall be **secured** when installed so as to prevent accidental displacement by the wind, equipment, or employees."
- **(i)(4):** "All covers shall be **color coded** or they shall be **marked with the word 'HOLE' or 'COVER'** to provide warning of the hazard."

> **THE PARKING-LOT TRAP — DO NOT FALL INTO IT.** An active parking lot **is** a "roadway or vehicular aisle." That flips ESC from the (i)(2) test — which a sheet of plywood might pass — to the **(i)(1) test: twice the maximum axle load of the largest vehicle expected to cross.** At a public-safety building, the largest vehicle is not a cruiser; it is a **responding fire apparatus or ambulance**, whose axle load can be in the **20,000–24,000 lb** range, requiring a cover rated at **40,000–48,000+ lb**. **No plywood and no light steel plate meets that.**

ESC's two permitted responses, in order of preference:

1. **ELIMINATE THE VEHICULAR EXPOSURE (preferred, and cheaper).** Physically exclude vehicles from the shaft area with a **hard barrier** — concrete barrier, water-filled barrier, or equivalent — not cones and tape. With vehicles positively excluded, the cover reverts to the **(i)(2)** test. This exclusion is coordinated in writing with the GC and the facility owner and is a **bid assumption**, including any required maintenance of emergency-vehicle access routes.
2. **ENGINEER THE COVER.** Where a vehicle route cannot be excluded, ESC will use a **steel road plate**, sized, bedded and pinned or otherwise secured, **supported by a written capacity calculation stamped by a Massachusetts-registered Professional Engineer demonstrating that the plate carries, without failure, at least twice the maximum axle load of the largest vehicle expected to cross it.** The engineer's name, license number and seal appear on the stamped calculation; the calculation is filed as **Appendix 3-J** and is in the site file **before** the plate is placed over a shaft in a vehicle path. **The governing axle load is obtained in writing from the facility owner for the heaviest apparatus that will cross — at a public-safety building that is a responding fire engine or ambulance, not a cruiser. ESC does not assume it.** The plate is still **secured** per (i)(3) and **marked "HOLE" or "COVER"** per (i)(4) — the (i)(4) exception for cast-iron manhole covers and street grates does **not** extend to ESC's temporary plates.

Largest vehicle expected to cross: _____ Max axle load, stated in writing by the facility owner: _____ lb

Required cover capacity (2× max axle load): _____ lb

Plate thickness: _____ in Plate size: _____ × _____ ft Bedded and pinned/secured: □

PE-stamped capacity calculation on file (Appendix 3-J) — dated: _____ Marked "HOLE"/"COVER": □

3.9.4 The casing-stickup guardrail — compliance for free. 29 CFR 1926.502(b) guardrail criteria: top edge **42 in ± 3 in** above the walking/working level; a midrail is required **only where there is no wall or parapet at least 21 in high**; the top edge must withstand **200 lb** applied within 2 in of the top edge in any outward or downward direction without deflecting below **39 in**; intermediate members withstand **150 lb**.

> **ESC STANDARD DETAIL: Where temporary casing is installed, the casing is set with a MINIMUM 42-INCH STICKUP above grade.** A solid full-height casing wall **is** the "wall" contemplated by 1926.502(b)(2), so no midrail is required; it satisfies the guardrail duty under 1926.501(b)(4)(i) and 1926.501(b)(7)(ii), **and** it physically blocks tools, spoil and feet from being kicked into the shaft. This converts a dewatering necessity into the compliant collar guardrail **at zero added cost.** It does not, by itself, satisfy the **cover** duty of 1926.501(b)(4)(ii)–(iii) — the shaft is still covered whenever it is not being actively worked.

3.9.5 Diameter is irrelevant. All drilled shafts require fall protection at the collar. There is no "small hole" exemption and there is no 30-inch threshold. A worker's leg through a 12-inch hole breaks a femur; a worker's body through a 36-inch hole is a fatality.

3.9.6 The four lifecycle states of a shaft — and the one that kills people.

State	Condition	Required control
(a) Rig assembly / disassembly / maintenance at height	Worker on the machine	Machine guardrails (passive) or PFAS; ladder or aerial work platform for access; no free-climbing the mast
(b) Shaft under construction, crew working at the collar	Hole open, crew engaged	Once depth reaches 6 ft: **guardrail (42-in casing stickup)** or **personal fall protection** (retractable lanyard, inspected before each use, anchorage capable of **5,000 lb** or 2× the intended load per employee, per 29 CFR 1926.502(d)(15)). Cover duty per (b)(4)(ii)–(iii) is met by the casing stickup blocking step-in, or by a cover whenever the crew steps away.
(c) Shaft excavated but NOT being worked	**THE KILLER STATE**	**Guardrail on all sides OR completely covered.** Cover **secured** and **marked "HOLE" or "COVER." PLUS** hard barricade in any vehicular area.
(d) Shaft concreted	Hazard eliminated	None — but the collar is protected until the concrete is set and the surface is safe to walk.

State (c) is where people die. It is the lunch break. It is the end of the shift. It is waiting on the concrete truck. It is waiting on the rebar cage. It is the fifteen minutes the crew went to move the rig. **The hole is still there and everyone has stopped thinking about it.**

3.9.7 ESC'S ABSOLUTE OPEN-HOLE RULES.

> 1. **NO SHAFT IS EVER LEFT OPEN AND UNATTENDED. EVER.** 2. **ESC's standard sequence is DRILL → CLEAN (BY TOOLING) → SET CAGE → CONCRETE, ALL IN THE SAME SHIFT.** Shafts are not drilled ahead of the concrete supply. The crew does not open more holes than it can close. 3. **If concrete is delayed, or the crew steps away for ANY reason — including for lunch, for a rig move, for a delivery, or for the end of the shift — the shaft is COVERED (secured + marked) AND BARRICADED BEFORE the crew steps away.** 4. **The Competent Person personally verifies and SIGNS the End-of-Shift Open Hole Checklist (Appendix 3-I) before the last ESC employee leaves the site.** No exceptions. 5. **The last person to leave walks every shaft location.** Count the holes. Count the covers. They must match. 6. Covers are inspected daily and after any vehicle, equipment or weather event that could displace them.

3.9.8 The duty runs to everyone, not just ESC employees. The fall-protection duty at a drilled shaft extends to the GC's employees, other contractors' employees, owner's representatives, site safety personnel, facility staff and the public. ESC will protect the hole against **all** of them, and will notify the GC in writing of every open shaft and every cover, and of the date each is closed.

3.9.9 Barricades, signage and traffic control in an active lot. Where a shaft is open in or adjacent to an active parking lot, drive aisle, sidewalk or emergency-vehicle route:

- **Hard barricade** (concrete or water-filled barrier) between the shaft and any vehicle path;
- Barricade tape and cones **supplement** — they never substitute for — the hard barrier and the cover;
- **Lighted barricades or retroreflective devices at night**;
- Signage: "DANGER — OPEN EXCAVATION," "HOLE," "NO ENTRY";
- Traffic control conforming to **MUTCD Part 6** and the AHJ;
- Pedestrian routing that keeps the public entirely outside the RAZ;
- **Emergency access is maintained at all times** and is agreed with the general contractor and the facility owner **in writing before mobilization**. **Where the site serves an occupied facility, the routes that facility's own vehicles and occupants depend on — apparatus bays, ambulance and emergency egress, and building exits — stay clear at all times: no rig, no ready-mix truck, no spoil pile, no barricade, ever, for any duration.** The occupant's own non-emergency lines are recorded on the site emergency card; **in an emergency the call is 911.** The individual designated by the owner as ESC's day-to-day facility contact, and the date the written access and traffic-control agreement is signed, are recorded at the preconstruction meeting:

Facility point of contact (print name / title): _____ Direct phone: _____

Signed access / traffic-control agreement — date: _____ Countersigned by the general contractor: □ Countersigned by the facility owner: □

Emergency access routes and building egress shown as permanent exclusion areas on the site plan: □

3.9.10 Rescue plan for a fall into a shaft. ESC's controls are designed to make this impossible. Nevertheless, a written **site-specific emergency and rescue plan** is prepared for every project and posted at the site trailer and in the rig:

- **ESC does NOT perform shaft rescue.** ESC employees do **not** enter a shaft to retrieve a person. A would-be rescuer entering a 36-in bore becomes the second victim; this is the dominant fatality pattern in confined-space and shaft incidents.
- Call **911** immediately and state: "person fallen into a _____-inch diameter, _____-foot deep drilled shaft, **technical rescue required**." **Say the diameter and the depth — they are what selects the response.**
- Local emergency services / technical rescue: **911. Proximity is not a rescue plan, and ESC never assumes that the responding department carries technical (confined-space / high-angle) rescue capability** — not even where the responders are close by, and not even where the site itself serves them. Before mobilization the Competent Person will meet the responding fire department, walk the site, brief the shaft geometry and the no-entry policy, and **obtain in writing which agency provides the technical-rescue response for a shaft of that diameter and how it is summoned.** The confirmation is recorded here and posted at the rig:

Technical rescue provided by (agency): _____ Summoned via: □ 911 □ other: _____

Capability confirmed in writing by (name / title): _____ Date confirmed: _____

- Nearest hospital / emergency room: **recorded on the Site-Specific Emergency Information Sheet before the first shift, with the route driven and the actual time written down.** Where that hospital is a community hospital and **not** a verified trauma center, the crew must know it — for a crush, degloving, amputation or major blunt trauma, say those words to the 911 dispatcher and let EMS pick the destination. The nearest **Level 1 trauma center is Lahey Hospital & Medical Center, 41 Mall Road, Burlington, MA 01805 — (781) 744-5100**; the region's replantation referral center is the **Massachusetts General Hospital Hand & Arm Service, 55 Fruit Street, Boston — MGH Emergency Department (617) 724-4100**.
- Site address and access route given to dispatch: **written on the Site-Specific Emergency Information Sheet, exactly as it is to be said to the dispatcher.** The gate, the staging point and the ambulance meeting point are **fixed at the preconstruction site walk with the general contractor and the facility owner, marked on the site plan, briefed at every toolbox talk, and posted at the rig and in the site trailer.** A person is sent to the meeting point to flag in and escort responders:

Gate / site entrance used: _____ Equipment staging point: _____

Ambulance / apparatus meeting point: _____ Person assigned to meet and escort responders: _____

- Do not lower equipment or people into the shaft. Do not run the rig. Shut down the rig and secure it. Establish an exclusion zone.
- Maintain voice contact with the victim if possible; do not attempt to move him.
- ESC will **confirm the local technical rescue capability in writing before mobilization** and record the confirmation.

3.10 ESC NO-MAN-ENTRY POLICY

3.10.1 THE POLICY.

> **NO ESC EMPLOYEE, AND NO PERSON UNDER ESC'S DIRECTION, WILL EVER ENTER A DRILLED SHAFT. THERE ARE NO EXCEPTIONS. THERE IS NO FIELD WAIVER. NO ESC SUPERVISOR, FOREMAN, OFFICER, CLIENT OR GENERAL CONTRACTOR HAS THE AUTHORITY TO AUTHORIZE ENTRY. SHAFT CLEANOUT IS BY TOOLING ONLY** — cleanout bucket, muck bucket, airlift or pump. Inspection is by **camera, sounding, calibrated probe, or shaft inspection device (SID)** — not by a body in the hole.

3.10.2 Why — the hierarchy of controls. The hierarchy puts **elimination** first. ESC eliminates the hazard rather than managing it. **No entry means:** no atmosphere to test, no ventilation to maintain, no attendant to post, no retrieval system to rig, no entry permit to administer, and — decisively — **no rescue that cannot realistically be performed.**

3.10.3 Why — the hazards are unmanageable. A drilled shaft presents **every hazard of a permit-required confined space**, measured against the criteria at 29 CFR 1926.1202:

1. **Hazardous atmosphere.** Carbon dioxide and other heavy gases accumulate at the bottom of a shaft. Oxygen deficiency develops. Carbon monoxide from the rig's diesel at the collar sinks into the bore. The atmosphere at the bottom of a 12-ft shaft can be lethal while the air at the collar tests clean.
2. **Engulfment.** Sidewall raveling and collapse — especially through boulder horizons, a soil/rock interface, and below the water table — and groundwater inflow. Casing does not make a hole safe; it makes it *cased*.
3. **Internal configuration.** A **36-inch bore is barely wider than a man's shoulders.** There is zero maneuvering room. A worker who slumps, faints or is struck cannot right himself and cannot be extracted by pulling on a harness line without injury.
4. **Other serious hazards.** Falling tools and spoil; the rig above; concrete or slurry inflow; drowning.

3.10.4 The legal point — get it right. ESC's documents will **not** state that a drilled shaft is a permit-required confined space "under 29 CFR 1926.1201," because **29 CFR 1926.1201(b) expressly excludes** from Subpart AA (1) construction work regulated by **Subpart P — Excavations**, (2) construction work regulated by **Subpart S — Underground Construction, Caissons, Cofferdams and Compressed Air**, and (3) Subpart Y — Diving. A drilled shaft is an **excavation**, so **Subpart P** is the operative OSHA standard, and 29 CFR 1910.146 does not apply to construction at all.

> **ESC's correct and stronger statement: a drilled shaft presents ALL of the hazards of a permit-required confined space, and ESC treats it as one as a matter of company policy — by prohibiting entry outright.**

3.10.5 What would be required if entry were ever contemplated — and why ESC does not do it. If ESC ever contemplated entry, the following would all be required, and **ESC has elected not to build any of it, which is why entry is prohibited**:

- A **written entry program** and a written, site-specific **rescue plan**;
- A determination **by a qualified person that there is no less hazardous alternative method** to accomplish the work. **Tooling is always a less hazardous alternative, and it always exists — so that test can never be satisfied in ESC's favor for entry.**
- **Full-depth casing** of the shaft;
- **Atmospheric testing before entry** — 29 CFR 1926.651(g)(1)(i) requires testing before employees enter an excavation more than 4 feet deep where an oxygen deficiency or a hazardous atmosphere could reasonably be expected, with flammable gas kept below **20% of the lower flammable limit** — plus **continuous monitoring** and forced-air ventilation;
- **Emergency rescue equipment** — breathing apparatus, a safety harness and line, or a basket stretcher — **readily available and attended when in use** (29 CFR 1926.651(g)(2));
- A **full-body harness and lifeline** on every person entering or being hoisted, secured to an anchorage above the point of operation, plus a means of retrieval (29 CFR 1926.104; 29 CFR 1926.502(d));
- An **attendant**, an **entry supervisor**, a **retrieval system**, and a **pre-arranged, confirmed technical rescue team**;
- Documented training for every entrant, attendant and supervisor.

3.10.6 The plain fact that ends the discussion. At 36 inches, the shaft is too narrow for a rescuer wearing an SCBA to descend and reach a collapsed worker. A rescue that cannot be performed is not a rescue plan. ESC does not send people into holes it cannot get them out of.

3.10.7 Communication of the policy. This policy is stated in ESC's bid documents, in every site-specific safety plan, in the drilling JHA, at every preconstruction meeting, at the daily toolbox talk, and to the GC in writing. Where a specification, a GC, an inspector or a client requests hand-cleaning or human inspection of a shaft bottom, **ESC will refuse the method and propose tooling, airlift, pump, camera or SID alternatives.** ESC will not price, and will not perform, man-entry.

3.11 Spoils, Cuttings and Slurry Management

3.11.1 Setback. Spoil, excavated material and equipment are kept **at least 2 feet from the edge** of any excavation, or retained by a device sufficient to prevent material from falling or rolling into the excavation, or a combination of both — **29 CFR 1926.651(j)(2)**. At a drilled shaft, ESC's practice is a **greater setback** than the 2-ft minimum: spoil is spun off or dumped into a **designated stockpile or a truck**, not ringed around the collar, because a spoil ring at the collar (a) surcharges and destabilizes the shaft wall, (b) rolls back into the hole and contaminates the base, and (c) is a trip hazard at the most dangerous edge on the site.

3.11.2 Protection from falling material. 29 CFR 1926.651(j)(1): adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face — by scaling, protective barricades, or other equivalent means.

3.11.3 Designated spoil area. The spoil area is designated in the site-specific plan, is inside or adjacent to the RAZ, is barricaded, does not block emergency vehicle access, does not load a utility or a vault, does not surcharge an adjacent excavation or slope, and does not obstruct sight lines for the operator or the signal person.

3.11.4 Wet, always. Cuttings, rock spoil and drill spoil are **wetted as they come out of the hole and wetted on the stockpile** before loading (29 CFR 1926.1153 Table 1 (xviii)) — with a hose, a water tote, a misting wand or a water truck. Water is applied at flow rates **sufficient to minimize the release of visible dust** — but not so much that it creates a mud slurry hazard.

3.11.5 Loading and hauling. Loading spoil into trucks is Table 1 (xviii) work: apply water and/or dust suppressants, **or** operate from an enclosed cab **only if the operator is the only employee engaged in the task** — which, with spotters and laborers present, he usually is not. Loads are covered. Truck routes are agreed with the GC and the AHJ. Tracked mud is cleaned from the public way (wet methods).

3.11.6 Slurry. Saw slurry, core slurry and drilling slurry are cleaned up **before they dry**, with a shovel or a **HEPA-filtered wet vacuum**. Dried slurry is a silica dust source. **Dried slurry is never dry-swept and never blown off with compressed air** (29 CFR 1926.1153(f)(1) and (f)(2)). Where mineral (bentonite/polymer) slurry is used for hole stability, its handling, containment, testing, reuse and disposal follow the project's slurry specification and the manufacturer's **Safety Data Sheet**. **The SDS for every slurry product brought to site is obtained from the supplier before the product arrives, is filed in the site SDS binder and on the rig, and is briefed to the crew at the toolbox talk (29 CFR 1926.59 / the Hazard Communication Standard). No product comes through the gate without its SDS.** On the current project the shafts are stabilized by **temporary casing**, not by mineral slurry; if the method changes, the product and its SDS are recorded here before it is used:

Slurry product (trade name) and manufacturer: _____ SDS obtained (date): _____

SDS in the site binder: □ On the rig: □ Briefed to the crew (date): _____

Slurry pits and tanks are barricaded and covered.

3.11.7 Stormwater and environmental. Spoil, slurry and drill water are managed to prevent discharge to storm drains, wetlands and waterways.

The division of responsibility, stated plainly so there is no gap. The project **SWPPP is the general contractor's document** — the GC holds the permit coverage, writes the plan, and owns the site-wide perimeter controls, the stabilized construction entrance and the SWPPP inspection log. **ESC works to that plan and is responsible for erosion, sediment and discharge control within its own work area**: inlet protection on every drain within or downgradient of the Restricted Access Zone, containment of drill water and slurry, wetting and wet-sweeping of material tracked onto the pavement or the public way, drip pans and a spill kit at the rig, and the concrete washout ESC uses. ESC obtains a copy of the SWPPP before mobilization and confirms the split in writing with the general contractor at the preconstruction meeting rather than discovering it after a rain:

SWPPP received from the general contractor (date): _____ Reviewed with the Competent Person: □

Inlet protection installed at drains within/downgradient of the RAZ: □ Locations: _____

Written confirmation of the GC/ESC erosion-control split — dated: _____

Protected features identified for the project — leach fields, stormwater basins, wetlands, drainage structures — are exclusion areas on the posted site plan: no equipment travel, no spoil placement, no laydown, no washout. Concrete washout is to a designated, lined containment — **never** to the ground, a drain, or a shaft. A release of oil, diesel or hydraulic fluid of **10 gallons or more**, or any release of any size that reaches a wetland, a surface water, a storm drain or a drinking-water resource area, is presumed reportable: stop work, contain it, notify the Competent Person and the general contractor immediately, call the **local fire department**, and notify **MassDEP at 1-888-304-1133 within 2 hours** (310 CMR 40.0311). **When in doubt, report.**

3.12 Dewatering, Wet-Hole Work and Tremie Concrete Placement

3.12.1 Groundwater. Where groundwater is encountered above the shaft base, ESC will use **temporary casing**, a **wet (fluid-filled) hole**, or **dewatering** as required by the shaft design and the geotechnical report. **A shaft is never left to "drain."** Groundwater inflow undermines the shaft wall, undermines the rig's working platform, and destabilizes the hole.

3.12.2 Excavation water accumulation — 29 CFR 1926.651(h). Employees shall not work in excavations in which there is accumulated water, or in which water is accumulating, unless adequate precautions have been taken. Where water is controlled or prevented by water removal equipment, the equipment and its operation shall be **monitored by a competent person**. If the excavation interrupts the natural drainage of surface water, ditches, dikes or other suitable means shall be used to prevent surface water entering the excavation. **Excavations subject to runoff from heavy rains require the Competent Person to inspect them per 1926.651(k).**

Because **ESC personnel never enter a shaft (§3.10)**, no ESC employee is ever *in* accumulated water in a shaft. The rule remains relevant to the crew **at the collar**: the platform and the collar must be kept firm and drained.

3.12.3 Pumps and hoses. Dewatering pumps are set outside the RAZ where practical; discharge hoses are routed out of walkways and travel paths; discharge is directed to the designated, permitted discharge point, not to a storm drain or a neighbor. Electric pumps are **GFCI-protected** and use **watertight, sealable connectors** — water plus electricity is a fatal combination and the same GFCI rule applies to any water-fed saw or core drill (29 CFR 1926.404(b)(1)).

3.12.4 Wet-hole (tremie) placement — the concrete rules. Where concrete is placed in a fluid-filled shaft, placement is by **tremie or concrete pump** in accordance with the shaft design. ESC's safety rules for concrete placement, per 29 CFR 1926 Subpart Q:

1. **Concrete pumping systems (29 CFR 1926.702(e)):** systems using discharge pipes shall be provided with **pipe supports designed for 100% overload**; compressed air hoses used on concrete pumping systems shall be provided with **positive fail-safe joint connectors** to prevent separation of sections when pressurized. **Whip-checks on every connection.**

2. **A pump line separation under pressure is a fatal struck-by event.** Nobody stands in line with, straddles, or holds a pressurized delivery line. The line is secured and supported. Blockages are cleared **only** by relieving pressure first and following the pump manufacturer's procedure — **never** by striking, kinking or opening a pressurized line.
3. **Nobody stands under a suspended tremie section, hopper or bucket** (§3.6.2, absolute rule 4; and 29 CFR 1926.701(e) — no employee shall be permitted to ride concrete buckets, and employees shall be kept out from under concrete buckets while being elevated or lowered).
4. **Tremie handling:** tremie pipe sections are heavy, slick and are lifted over an open hole. All personnel at the collar are protected by the casing stickup guardrail (§3.9.4) or by PFAS with a 5,000-lb anchorage. Hands are out of the make-up joints; drift pins and hammer wrenches only.
5. **Maintain the concrete head.** The tremie tip is kept embedded in the fresh concrete per the design, and the concrete head is maintained above the bottom of the casing during extraction (§3.7.7). Loss of the seal is a shaft defect and a re-work event; a defective shaft is a structural failure waiting to happen.
6. **Wet concrete is caustic (29 CFR 1926.28 / PPE).** Employees handling wet concrete wear **impervious gloves, eye protection (Z87.1), long sleeves, long pants and rubber boots**. Concrete on skin is washed off immediately; concrete in the eye is flushed for **15 minutes** and treated as a **medical emergency** — chemical burns from Portland cement develop hours later and cause full-thickness burns. Eyewash is on the truck and at the pour.
7. **Rebar impalement (29 CFR 1926.701(b)):** all protruding reinforcing steel onto and into which employees could fall shall be **guarded to eliminate the hazard of impalement**. Rebar caps alone are not impalement protection unless rated; ESC uses **impalement-rated caps or troughs** and, where a fall from height onto rebar is possible, removes the fall exposure. Cage dowels projecting from a completed pier are capped and, where in a walkway, barricaded.
8. **Post-placement:** the shaft collar is protected until the concrete has set and the surface is safe to walk. Formwork/sonotube above grade is braced. A curing pier top is barricaded so no one steps in it.
9. **Cold weather:** water-fed silica controls and slurry systems freeze. Provide freeze protection or the wet controls fail (29 CFR 1926.1153(c)(2)(ii) — the flow must still be sufficient to minimize visible dust). Concrete cold-weather protection follows the specification.

3.12.5 Shaft inspection without entry. Base cleanliness and shaft geometry are verified by **cleanout bucket returns, sounding, calibrated probe, downhole camera, or a shaft inspection device (SID)** — never by lowering a person. Where a specification appears to require human inspection of the shaft base, ESC will propose an equivalent no-entry method in writing at bid time (§3.10.7).

3.13 Housekeeping Around the Rig

3.13.1 Why it matters. The deck of a drill rig, the collar of a shaft and the ground around a rig are the highest-consequence walking surfaces on the site. A slip at the collar is a fall into a hole. A trip on a hose near a turning kelly is an entanglement.

3.13.2 Rules.

1. **Hoses, cords, cables, slings, chains and tag lines** are routed, coiled and hung — never left across a walkway, a travel path, the collar or the rig's access steps.
2. **Tools are put away.** Nothing loose at the collar. A wrench kicked into a shaft becomes a projectile and, later, a defect in a pier.
3. **The rig deck and steps are kept free of mud, ice, grease, spoil and slurry.** Three-point contact on all rig access. No jumping down from the deck or the tracks.
4. **Spills are cleaned immediately.** Diesel and hydraulic fluid are slip hazards and environmental releases. A spill kit is on the rig and its location is briefed.
5. **Wet methods only for dust cleanup.** Wet sweep, squeegee, wet vacuum or HEPA vacuum. **Dry sweeping and dry brushing of cuttings, rock dust and slurry are PROHIBITED** (29 CFR 1926.1153(f)(1)).
6. **Compressed air is PROHIBITED** for cleaning the auger, the tooling, the deck, the drilled holes, surfaces or clothing, unless it is used together with a ventilation system that effectively captures the dust cloud (29 CFR 1926.1153(f)(2)). **Blowing off the auger with the rig's air is standard practice in this industry and it is a per-instance violation. ESC does not do it.** Employees are never permitted to blow off their own clothing with compressed air.
7. **Vacuum filters and dust bags** are changed before they overfill; changing them is itself a dust-generating task. Used filters, bags and disposable PPE are **double-bagged and sealed** for disposal.
8. **Fuel, oil and grease** are stored in approved containers in a designated area with secondary containment, away from ignition sources, and away from the shaft.
9. **Waste, banding, dunnage, packaging and rebar tie wire** are collected continuously, not at the end of the week.
10. **Lighting.** Adequate illumination is provided per 29 CFR 1926.56 for any work performed in low light. **ESC's default is that drilling does not occur in darkness** absent a written plan approved by the Competent Person, adequate lighting, and — near overhead lines — the illumination and safe-path requirements of 29 CFR 1926.1411.
11. **Fire.** A rated fire extinguisher is on the rig and at the fuel storage area, inspected monthly (29 CFR 1926.150). Hot work (cutting/welding casing or tooling) requires a hot work permit, a fire watch, and clearance from combustibles.
12. **Sanitation, potable water, and heat/cold stress.** Potable water, cups, toilets and hand-washing are provided per 29 CFR 1926.51. Heat and cold stress procedures are in **Part 2, Sections 2.6 and 2.7**.

3.13.3 PPE — minimum, at all times inside the RAZ.

- Hard hat (ANSI Z89.1)
- Safety glasses (ANSI Z87.1); **face shield over Z87.1 glasses for chipping, chiseling, hoe-ramming, grinding and percussion drilling at the collar**
- High-visibility apparel (ANSI/ISEA 107) — **Class 2 minimum; Class 3 for any work in or adjacent to a live traffic or parking area, and for flaggers**
- Safety-toe, puncture-resistant work boots (ASTM F2413)
- **Hearing protection whenever the rig, a hammer, a hoe-ram or a compressor is running**
- Gloves appropriate to the task — **removed near rotating components** (§3.6.5)
- Respiratory protection when required by **Part 2, Sections 2.3 and 2.4**; medical evaluation and fit testing must precede use (29 CFR 1910.134)
- Personal fall arrest when required by §3.9.6; anchorage rated **5,000 lb** or 2× the intended load per employee (29 CFR 1926.502(d)(15))
- **NO loose clothing, NO jewelry, NO dangling lanyards near the drive** (§3.6.5)

3.14 Training, Documentation and Records for This Part

3.14.1 Required training. Before any employee works on an ESC drilled-shaft operation, ESC will train and document (29 CFR 1926.21(b)(2)):

Topic	Standard
Site-specific safety plan and JHAs	29 CFR 1926.21(b)(2); §3.1
Rotating auger / kelly entanglement; the auger-cleaning procedure	§3.6
Overhead power lines; Table A / Table T; the **electrical contact emergency procedure**	29 CFR 1926.1408(g)(1)
Dedicated spotter duties (spotters only)	29 CFR 1926.1408(g)(2); 1926.1430(g)
Underground utilities; Dig Safe; tolerance zone; **strike response**	29 CFR 1926.651(b); M.G.L. c.82 §40
Fall protection at the collar; covers; the open-hole rules	29 CFR 1926.503; §3.9
The NO-MAN-ENTRY policy and why	§3.10
Respirable crystalline silica (six mandatory knowledge topics; four mandatory hazards: **cancer, lung effects, immune system effects, kidney effects**)	29 CFR 1926.1153(i)
Hearing conservation	29 CFR 1926.52
Rigging, slings and signals	29 CFR 1926.251
Concrete and rebar impalement	29 CFR 1926 Subpart Q
Emergency action and rescue	§3.9.10
Identity of the Competent Person and his stop-work authority	29 CFR 1926.1153(i)(2)(i)(E); §3.0.6

Training record — Date: _____ Trainer: _____ Signed attendee roster attached: □

Refresher frequency — **ESC standard: annual, and on any change of method or equipment.**

3.14.2 Records retained for this Part.

- Site-specific safety plan and JHAs (retained for the life of the project, minimum)
- Daily Drill Rig Inspection forms (29 CFR 1926.20(b)(2); §3.3.8)
- Pre-task briefing / toolbox talk sign-in sheets

- Overhead Line Survey and utility voltage correspondence
- Dig Safe ticket(s), locate records, GPR report, soft-dig records
- Operator Qualification & Authorization records
- Dedicated Spotter and Signal Person designations
- Lift plans (auxiliary-winch lifts — cages, casing and any non-tooling pick)
- PE-stamped cage lift design and working platform design
- End-of-Shift Open Hole Checklists (signed by the Competent Person)
- Competent Person silica control checklists and silica task-duration logs
- Training rosters
- Incident reports and near-miss reports

3.14.3 Recordkeeping note. ESC has had **10 or fewer employees at all times during 2023, 2024 and 2025** and is therefore **partially exempt** from routine OSHA injury and illness recordkeeping (the OSHA 300 Log) under **29 CFR 1904.1**. **That exemption reaches nothing else.** ESC must still report a **fatality within 8 hours** and any **in-patient hospitalization, amputation or loss of an eye within 24 hours** under **29 CFR 1904.39**; and every requirement of 29 CFR 1926 — including the full silica standard (29 CFR 1926.1153) and its 30-year exposure-record retention under 29 CFR 1910.1020 — applies to ESC in full regardless of size.

3.15 Appendices Referenced by This Part

- **Appendix 3-A** — Daily Drill Rig Inspection Form
- **Appendix 3-B** — Overhead Line Survey Form and Utility Voltage Request Letter (2-working-day clock per 29 CFR 1926.1408(c))
- **Appendix 3-C** — Power Line Encroachment Prevention Checklist (planning meeting / non-conductive tag lines / elevated warning line / additional measure)
- **Appendix 3-D** — Dedicated Spotter and Qualified Signal Person Designation
- **Appendix 3-E** — Utility Clearance Form (Dig Safe ticket, member responses, private locates, GPR, soft-dig record)
- **Appendix 3-F** — Utility Strike Response Card (pocket card)
- **Appendix 3-G** — Drilled Shaft JHA
- **Appendix 3-H** — Pre-Task / Toolbox Briefing Form
- **Appendix 3-I** — End-of-Shift Open Hole Checklist
- **Appendix 3-J** — Shaft Cover Detail and Capacity Calculation (2× axle load where in a vehicular aisle)
- **Appendix 3-K** — Lift Plan (auxiliary winch)
- **Appendix 3-L** — Operator Qualification & Authorization Record
- **Appendix 3-M** — Emergency Action and Shaft Rescue Plan (site-specific)
- **Appendix 3-N** — Silica Task Duration Log and Competent Person Silica Control Checklist (cross-reference **Part 2, Section 2.3**)

PART 4 — LIFTING, RIGGING, CONCRETE & GENERAL CONSTRUCTION SAFETY

4.1 Lifting, Rigging and Crane Operations

4.1.1 Purpose and Scope

This section governs every lift Earth Support Corp. ("ESC") performs: setting reinforcing steel cages into drilled shafts, handling and setting temporary casing, picking and changing drill tooling (augers, core barrels, rock augers, cleanout buckets, chisels), and placing tremie pipe and hoppers. ESC performs these lifts on the **drill rig's own auxiliary winch**, within the manufacturer's rated capacity and load chart; ESC brings no separate lifting machine. Rebar and casing are offloaded from delivery trucks by a rated lifting device furnished by others — the auxiliary winch is never used to offload a trailer (§4.1.3).

ESC self-performs deep foundation and earth retention work. Lifting is not incidental to that work — it is a daily, high-consequence activity. The two mechanisms that kill and maim in this trade are **contact with an energized overhead power line** and **equipment overturn while lifting at radius**. Both are addressed here and in **Part 3, §3.4 (Overhead Power Lines)** and §3.3 (Rig Stability).

4.1.2 The Dedicated Drill Rig Is Not a Crane

29 CFR 1926.1400(c)(11) excludes **"dedicated drilling rigs"** from Subpart CC (Cranes and Derricks in Construction). ESC's self-contained crawler/carrier-mounted drilled-shaft rig is a dedicated drilling rig, and Subpart CC therefore does not bind it as a matter of law.

ESC does not treat that exclusion as permission. ESC policy:

1. **ESC voluntarily adopts the Subpart CC overhead power-line regime (the 20-foot rule, Table A, and Table T) as company policy for all equipment on site, including the dedicated drill rig.** One rule for the crew is safer than two, and ANSI/ASSP A10.23 §12.6 imposes the same clearance distances on drill rigs by consensus standard regardless.
2. ESC's dedicated rig is governed by **ANSI/ASSP A10.23, *Safety Requirements for the Installation of Drilled Shafts*, by the** equipment manufacturer's operator manual**, and by 29 CFR 1926.600(a)(6) (minimum clearance from energized lines) and 1926.416(a)(1) and (a)(3) (electrical proximity and the duty to locate lines before work begins). Where no specific OSHA standard fits, OSHA enforces these hazards through** Section 5(a)(1) of the OSH Act (the General Duty Clause)**, referencing A10.23 and the operator's manual. Conforming to A10.23 is therefore both the safe answer and the legally defensible one.
3. **The operator's manual for the rig in use must be physically on the machine at all times.** Failure to have the correct manual on the rig, or to follow the manufacturer's recommended procedures, is a citable condition.

ESC brings only the drill rig, and does its own lifting on the drill rig's auxiliary winch — within the manufacturer's rated capacity and load chart (A10.23 §12.11). There is no separate hoisting machine on ESC's scope for cage setting, casing handling or tooling changeout. Because the dedicated drilling rig is excluded from Subpart CC as a matter of law (above), ESC does not lean on that exclusion: it holds the rig to the equipment manufacturer's manual, to A10.23, and to the power-line regime it has voluntarily adopted (§4.1.10), and it performs each cage and casing set under a **written lift plan** with an ESC-provided **qualified rigger and qualified signal person**. Sections 4.1.3 through 4.1.11 below govern that work.

4.1.3 The Auxiliary Winch — Hard Limits

The drill rig is not a crane. It has a fixed mast, a non-variable working radius, and an auxiliary winch whose line cannot be multi-parted. Rig overturn while lifting casing or a cage at radius is the single most common drill-rig overturn scenario in the industry.

Per **ANSI/ASSP A10.23 §12.11, §12.12 and §12.13**, and as ESC company policy:

1. The auxiliary winch shall be used **only within the limits established by the equipment manufacturer**, and **only** for lifting, supporting and lowering drilling and casting support equipment: drill tooling, casing sections, chisels, rope grabs, reinforcing cages, tremie/casting pipe and hoppers.
2. **Use of a multi-part load block to increase auxiliary winch capacity is PROHIBITED** absent **written** authorization from the equipment manufacturer (A10.23 §12.12). Verbal authorization is not authorization.
3. **The auxiliary winch shall NOT be used to offload material from trailers or trucks**, to move construction materials around the site, or for any general hoisting or material-handling purpose.
4. **No travel with a suspended load.** Loads are landed before the rig moves.
5. The machine shall be **level within the manufacturer's stated degree-of-level tolerance**, and **mast inclination shall not exceed the manufacturer's stated limit. These two values are machine-specific. Read the degree-of-level tolerance and the mast inclination limit for the rig in use from that machine's operator's manual, post them in the cab where the operator can see them, and confirm them at every setup before the winch takes any load.** Do not carry a remembered number from another machine. **Tracks shall be fully extended** for any lift.
6. Where the manufacturer permits the auxiliary winch to lift anything other than drilling tooling, a **written lift plan** shall be prepared and followed, and the activity shall appear in the Job Hazard Analysis (JHA).
7. Per A10.23 §12.13, determination of safe lifting capacities of auxiliary hoists on **mobile cranes** used for drilled shaft installation **shall include the suspended weight of all drill equipment attachments**. The kelly, rotary and tooling are part of the load.

RIG CONFIGURATION RECORD. For anchors, micropiles and drilled shafts ESC brings the drill rig; its make, model and serial are confirmed before mobilization (the two candidate rotary rigs are named in the record below). Every value below is read from that machine's operator's manual and stability/range chart, entered on this record before the first pick, and re-confirmed on the Daily Rig / Lifting Equipment Inspection Form (Appendix 3-A). **The manufacturer's stability/range chart for the machine on site is attached to this program as Appendix 4-A and a copy is kept in the cab.**

Item	Source	Entry
Rig make / model	ESC (drill rig)	**the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization**
Rig serial no.	Data plate	_____
Auxiliary winch rated line pull (lb), single part	Operator's manual	_____

Item	Source	Entry
Rated auxiliary winch capacity at the pick radius used	Manufacturer's range/stability chart	_____
Manufacturer's degree-of-level tolerance	Operator's manual	_____
Manufacturer's mast inclination limit	Operator's manual	_____
Operator's manual physically on the machine	Verify	Yes □ No — DO NOT OPERATE □
Values read and posted in cab by	Print / sign	_____
Date		_____

4.1.4 Cages and Casing Are Set on the Drill Rig's Auxiliary Winch

ESC brings only the drill rig and does its own lifting with the **drill rig's auxiliary winch**, within the manufacturer's rated capacity and load chart (**A10.23 §12.11**). Reinforcing cages, temporary casing sections and heavy tooling are lifted and set **straight into the shaft, near-vertical**, on that winch. The winch is used within the manufacturer's chart and no further: it is **never multi-parted to gain capacity without the manufacturer's written authorization (§12.12), never used to offload a trailer, never used to travel with a suspended load, and never used to lift a load out at a radius.** Lifting at radius is the single most common drill-rig tipping cause and is prohibited.

ESC's contribution to every lift is its own drill rig, the tooling, the PE-designed cage pick, and an ESC-provided **qualified rigger and qualified signal person**. ESC confirms the cage-setting and casing method — on the drill rig's auxiliary winch, within the manufacturer's chart — with the GC at the pre-construction meeting before any cage or casing pick.

Project scope block — completed per project before mobilization: number of piers, diameter, embedment, whether keyed to rock, concrete strength, cage configuration and computed cage weight, and pier groupings.

Piers: _____ Diameter: _____ Embedment: _____ Concrete: _____ Cage configuration: _____
Computed cage weight: _____ lb

Lifting method on every ESC drilled-pier project: the drill rig's own auxiliary winch, within the manufacturer's rated capacity and load chart. Every reinforcing cage is set, and all temporary casing handled, on the **drill rig's auxiliary winch** — the drill rig drills, and the same machine's winch sets the cage and handles the casing, **straight into the shaft, near-vertical.** ESC brings no separate lifting machine. The cage is a defined winch load within the chart, computed from the approved cage schedule; the winch is **never multi-parted without the manufacturer's written authorization (§12.12) and never used to lift at a radius.** ESC provides the **qualified rigger and qualified signal person** for placing the cage in its shaft. This method is coordinated with the general contractor at the pre-construction meeting.

Subpart CC — stated plainly. ESC's dedicated drilling rig is excluded from Subpart CC by **29 CFR 1926.1400(c)(11)** (§4.1.2), and ESC does not lean on that exclusion. It governs the aux-winch lift by the equipment manufacturer's manual, by A10.23 (§§12.11–12.13), and — for anything near a conductor — by the full power-line encroachment package it has voluntarily adopted (1926.1407, .1408, .1410, .1411; §4.1.10). Ground conditions under the rig follow **1926.1402(b)** as ESC company policy (§4.1.6); the rig operator is qualified and authorized under **A10.23 §12.19** (§4.1.8); and **ESC provides the qualified rigger (1926.1425 / 1926.1404(r)) and the qualified signal person (1926.1428)** for placing the cage in its shaft. **Nobody under the load, ever.**

Item	Entry
Lifting machine	**The drill rig's own auxiliary winch — one machine, ESC's.** Make, model and serial confirmed before mobilization (Soilmec R312-200 or IMT AF120 LCA)
Drill rig serial no.	_____
Auxiliary winch rated line pull (lb), single part (from the operator's manual)	_____
Rated auxiliary winch capacity in the near-vertical shaft-setting configuration used (from the manufacturer's chart)	_____
Manufacturer's load/range chart for this machine in the cab	Yes □ No — DO NOT OPERATE □
Multi-part blocking of the winch line — used only with the manufacturer's WRITTEN authorization (§12.12)	Not used □ Written authorization on file □
ESC-provided qualified rigger and qualified signal person confirmed by	Print / sign _____ Date _____

4.1.5 Reinforcing Cage Lift Design

Per **ANSI/ASSP A10.23 §9.3**: "*Reinforcing steel cages and their lift point(s) shall be designed by a registered Professional Engineer so as to withstand the forces applied to them when lifted from a horizontal to vertical position. The cage fabricator shall ensure the cage is assembled in accordance with the cage design.*"

1. Every ESC cage that is picked from horizontal to vertical shall have **PE-designed lift points and a PE-designed pick configuration**. **The cage lift points and pick configuration for this project are designed and stamped by a Massachusetts-registered Professional Engineer before the first cage is picked.** The stamped detail carries the engineer's name, seal, license number and date; it is kept in the site file, a copy is issued to the general contractor with the pre-construction submittal, and a copy travels with the cage crew. **No cage is rotated from horizontal to vertical until the stamped detail is physically on site.** The cage weight is computed from the approved cage schedule and posted in the cab.
2. Cages shall be assembled in accordance with the cage design, including stiffening bands, internal spreaders and pick-point reinforcement.
3. Per A10.23 §9.2, only rigging and equipment of **adequate capacity and configuration** shall be used. Rigging shall be selected for the **actual sling angle** in the pick, not the vertical rated capacity.
4. Cages shall be picked with the **drill rig plumb over the pick point**. Side-loading the mast to drag or "walk" a cage upright is prohibited.
5. The cage shall be **controlled with non-conductive tag lines** (see §4.1.9) during the horizontal-to-vertical rotation and during entry into the shaft.
6. The cage shall be **positively supported at the shaft collar** (hanging bars, lifting bars across the casing, or an approved cage hanger) before rigging is released. Rigging is **not** released from a cage that is only resting on the shaft bottom or friction-held in the casing.

4.1.6 Ground Conditions and Working Platform (Equipment Stability)

Per **29 CFR 1926.1402(b)** (cranes) and **ANSI/ASSP A10.23 §6.1.2** (drilled shaft equipment), equipment shall not be assembled or used unless ground conditions are **firm, drained and graded** to a sufficient extent that, in conjunction with supporting materials (mats, cribbing, blocking) if necessary, the **equipment manufacturer's specifications for adequate support and degree of level are met.**

The duty to PROVIDE adequate ground conditions rests with the controlling entity / project constructor — the general contractor — per 29 CFR 1926.1402(c)(1) and A10.23 §6.1.2. The controlling entity must also **inform ESC of the location of hazards beneath the equipment set-up area (voids, tanks, utilities)** where those hazards are identified in documents in its possession or are otherwise known to it, per 1926.1402(c)(2) and A10.23 §6.1.1.

ESC will therefore, on every project:

1. **Require in writing** that the general contractor provide a working platform meeting the rig manufacturer's ground-bearing and degree-of-level specifications, and disclose all known subsurface hazards beneath the rig set-up and travel areas. This is a bid condition, not an afterthought.
2. Obtain and record the rig's **track bearing pressure** and **degree-of-level limits** from the manufacturer's manual.
3. **Not accept an asphalt parking lot at face value as a working platform.** A wearing course over an unknown subbase, over known buried utilities and a shallow groundwater table, is not a designed platform. Where bearing is questionable, ESC will mat the machine.
4. **Mat the tracks for all casing handling and all cage picks**, where the machine is at its least stable.
5. Where there is no controlling entity, or where the GC does not perform the ground preparation, the duty migrates to the employer with authority to arrange it — ESC will not proceed on an inadequate platform on the assumption that someone else owns the problem.

Working platform design, where required, shall follow the **EFFC/DFI Guide to Working Platforms (current edition)** and/or **BRE Report BR470**. The platform is designed for the **maximum bearing pressure generated during operation** — crowd force, extraction force, mast moment and auxiliary winch load at radius — **not** the static weight of the machine.

WORKING PLATFORM — per project. The controlling entity / project constructor is the general contractor named on the counterparty block at Section 1.4.6, and **the working platform is that party's duty to provide** under 1926.1402(c)(1). **Where the setup area is existing pavement over an unverified subbase — which is the normal condition on an occupied lot, and is compounded by buried utilities and shallow groundwater — §4.1.6(3) applies in full: ESC does not accept existing asphalt at face value as a working platform.** ESC mats the tracks for every casing pick and every cage pick.

Item	Entry
GC written platform confirmation (bearing capacity + degree of level) received — date	_____

Item	Entry
Known subsurface hazards beneath rig set-up and travel areas disclosed by GC in writing — date	_____
Crane mats / cribbing — type and size	_____
Crane mats — quantity on site	_____
Platform accepted for use by Competent Person (Jean Prinsloo, CS-122896)	Sign _____ Date _____

4.1.7 Restricted Access Zone, Swing Radius and "Never Under the Load"

Per **ANSI/ASSP A10.23 §6.2 and §12.18**, and 29 CFR 1926.1424 (swing radius, for cranes):

1. **The swing radius of the drilling and lifting equipment shall be FULLY BARRICADED** (A10.23 §12.18). The crush zone between the rotating upper works / counterweight and any fixed object or vehicle is a fatality zone.
2. ESC shall establish a **Restricted Access Zone (RAZ)** around all drilling and hoisting areas to prevent access by persons not directly involved in the operation. **The RAZ shall be supervised by the Competent Person — Jean Prinsloo, MA CS-122896.**
3. The RAZ shall encompass the equipment, the drilling attachments, the shaft being drilled, the materials and work area for the operation being performed, **and the auger spin-off arc** (the area where spoil is thrown when the auger is cleaned) — A10.23 §6.2.1.
4. The RAZ **shall move with the progress of the work** and shall be marked with tape, cones or similar high-visibility identification (§6.2.2). In an active vehicular area the RAZ shall be delineated with **hard barrier** (water-filled or concrete barrier, or equivalent), not cones and tape alone — see §4.8.
5. Only personnel engaged in the drilled shaft installation are permitted inside the RAZ (§6.2.3). Only materials necessary for the operation being performed shall be stored in the RAZ (§6.2.4).
6. **Intrusions by other contractors' workers, owner representatives, or the public shall be promptly reported by ESC to the general contractor and the site owner in writing.** Per A10.23 §6.2.3, the project constructor and site owner shall take reasonable steps to prevent such intrusions. ESC will document each intrusion and each report.
7. **No employee shall be positioned under any portion of a suspended load or under the auger at any time** (A10.23 §12.16; 29 CFR 1926.1425(b) for cranes — keeping clear of the load). This is absolute. A load is never "just about to land."
8. Per **A10.23 §12.7**, **no person shall be in contact with the drill rig and the ground simultaneously during drilling** (electrical touch/step potential).

4.1.8 Qualified Rigger, Signal Person and Operator Qualification

Qualified rigger — 29 CFR 1926.1404(r)(1) and 1926.1425(c)(3): A **qualified rigger** is required whenever employees are engaged in hooking, unhooking or guiding a load, or in the initial connection of a load to a component or structure, and during assembly/disassembly. A "qualified rigger" is a rigger who meets the definition of "qualified person" in 1926.1401 — a person who, by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training and experience, has successfully demonstrated the ability to solve/resolve problems relating to the subject matter and the work. **Certification is not required by OSHA; employer qualification and documentation is.**

- **Qualified rigger is a ROLE ESC ASSIGNS, not a card ESC buys.** ESC **designates its qualified rigger(s) in writing at the pre-construction meeting**, before any load is hooked, and **names the designated rigger on the daily JHA for every shift in which a pick occurs.** The written designation records the basis of qualification — training provider and date, and the date of ESC's own documented evaluation of that person against the specific rigging, loads and pick configurations used on this work. The designation is retained in the site file and a copy is furnished to the general contractor.
- Rigging of rebar cages, casing and tooling shall be performed **only** by an ESC-designated qualified rigger.

Qualified rigger — written designation	Entry
Name (print)	_____
Basis of qualification (training provider / date, or extensive knowledge, training and experience)	_____
Date of ESC documented employer evaluation	_____
Designated by (Competent Person or Treasurer)	_____
Date of designation	_____
Signature of designated rigger	_____

Signal person — 29 CFR 1926.1428 and A10.23 §12.15:

- A **qualified signal person** shall be positioned **in full view of the equipment operator before any drilled shaft equipment is relocated** on site (A10.23 §12.15). Standard hand or voice signals shall be used.
- A signal person is required for crane operations whenever the point of operation is not in full view of the operator, the operator's view is obstructed, or site/operational conditions require it (1926.1428(a)).
- The signal person must be qualified by a third-party evaluator or by the employer's qualified evaluator, and must know and understand the signals used, be competent in their application, have a basic understanding of equipment operation and limitations, and know 1926 Subpart CC Section 1926.1419 through 1926.1422 (1926.1428(c)).
- **The operator shall accept signals only from the designated signal person — EXCEPT an EMERGENCY STOP SIGNAL, WHICH MAY BE GIVEN BY ANY WORKER** (A10.23 §12.15). This is stated at every toolbox talk. Any ESC employee, any other trade, any inspector may stop a lift.
- **Qualified signal person is likewise a ROLE ESC ASSIGNS.** ESC **designates its qualified signal person(s) in writing at the pre-construction meeting** and **names the designated signal person on the daily JHA for every shift in which a pick occurs.** The designation records how the person was qualified — third-party qualified evaluator, or ESC's own qualified evaluator — and the date. Setting a cage into a bore of the diameters ESC installs obstructs the operator's view of the landing zone as a matter of geometry, so **a designated signal person is required for every cage set, on every project.** There is no "we'll wing it" pick.

Qualified signal person — written designation	Entry
Name (print)	_____
Qualified by (third-party evaluator, or ESC's qualified evaluator)	_____
Date of qualification	_____
Signal system to be used (standard hand signals / voice / radio channel)	_____
Designated by	_____
Date of designation	_____
Signature of designated signal person	_____

Operator qualification:

- Per **A10.23 §12.19**, drilled shaft equipment operators **shall be qualified and authorized by their employer** to operate such equipment. ESC issues a **signed Operator Qualification/Authorization record naming the operator AND the specific machine.**
- **A10.23 §12.20 and 29 CFR 1926.1427** reach operators of cranes and crane-mounted drill attachments — machines ESC does not bring. ESC's self-contained drill rig is not a crane (§4.1.2), so its operator runs it under the **§12.19 employer qualification and authorization** regime, not a crane-operator certification. The **1926.1427(f)** principle — that the employer must **evaluate** each operator for the specific equipment and configuration and document it — ESC applies to its rig operator regardless.
- Certification is not qualification. ESC evaluates each operator on the **specific machine and task**, and re-evaluates whenever an operator is assigned a substantially different machine or task.
- **On certification numbers, ESC states only what it can prove.** A third-party operator certification is issued by an accredited testing organization, not by ESC. **The operator carries the card on his person on site, and a copy of the card — which is the only source of the certificate number and its expiry date — is furnished to the general contractor with the mobilization submittal.** ESC does not print a certificate number in this program, and **ESC does not claim a credential it does not hold**: where an ESC operator holds the NCCCO/ADSC Foundation Drill Rig (FDR) certification, the card is produced; where he does not, the drill rig is operated under ESC's written qualification and authorization per A10.23 §12.19, which is what the consensus standard requires for a dedicated drill rig.

OPERATOR QUALIFICATION / AUTHORIZATION RECORD. For the drill rig — the only machine ESC brings — one record per operator, signed by ESC before the operator touches the controls.

Item	Drill rig (ESC — the only machine ESC brings)
Machine	**the drill rig — one of two candidate rotary rigs (Soilmec R312-200 or IMT AF120 LCA); make, model and serial confirmed before mobilization**

Item	Drill rig (ESC — the only machine ESC brings)
Serial no.	_____
Operator name (print)	_____
Basis of authority	ESC written qualification & authorization (A10.23 §12.19)
Employer evaluation on this specific machine and configuration — evaluator	ESC evaluator: _____
Evaluation date	_____
Authorized by	ESC — Derek Snow, Treasurer, or Jean Prinsloo, Competent Person: _____
Date	_____

4.1.9 Slings, Rigging Hardware and Inspection — 29 CFR 1926.251

1. **Rated capacity.** Per 1926.251(a)(1), rigging equipment for material handling shall be inspected **prior to use on each shift and as necessary during its use** to ensure it is safe, and defective rigging equipment shall be removed from service. Per **1926.251(a)(6)**, **damaged or defective slings shall be *immediately* removed from service** — there is no "finish the pick first" allowance. Per 1926.251(a)(2)(ii), rigging equipment shall not be loaded in excess of its recommended safe working load.
2. **Identification.** Per 1926.251(a)(2)(i), rigging equipment shall have **permanently affixed and legible identification markings as prescribed by the manufacturer that indicate the recommended safe working load. A sling or lifting accessory without a legible capacity marking may not be used.** Per 1926.251(a)(3), rigging equipment, **when not in use, shall be removed from the immediate work area** so as not to present a hazard to employees. Per 1926.251(a)(4), **special custom design grabs, hooks, clamps or other lifting accessories shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.**
3. **Alloy steel chain slings** — 1926.251(b). Welded alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity and sling manufacturer. 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 chain**. **A thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, at intervals set on the basis of frequency of sling use, severity of service conditions, nature of lifts, 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.** The employer shall make and maintain a **record of the most recent month in which each alloy steel chain sling was thoroughly inspected**, and shall make it available for examination.
4. **Wire rope slings** — 1926.251(c). Shall not be used if, in any length of eight diameters, the total number of **visible broken wires exceeds 10 percent** of the total number of wires, or if the rope shows other signs of excessive wear, corrosion, or defect. Protruding ends of strands in splices shall be covered or blunted. Wire rope shall not be secured by knots. **An eye splice made in any wire rope shall have not less than three full tucks.** Wire rope shall not be used with loads over the rated capacities in the applicable tables.
5. **Synthetic web slings** — 1926.251(e). Each sling shall be marked or coded to show rated capacities for each type of hitch and type of synthetic web material. Synthetic web slings shall be **immediately removed from service** if any of the following are present: acid or caustic burns; melting or charring of any part of the sling surface; snags, punctures, tears or cuts; broken or worn stitches; or distortion of fittings (1926.251(e)(8)).
6. **Shackles and hooks** — 1926.251(f). Shall not be loaded in excess of the manufacturer's recommended safe working load.
7. **Sling angle.** Rated capacity **decreases sharply as the sling angle from horizontal decreases.** ESC riggers shall calculate the load per leg at the **actual** sling angle. A 30-degree sling angle **doubles** the tension in each leg relative to the vertical load.
8. **Softeners.** Slings shall be protected from sharp edges — rebar cage bars, casing edges, tooling flights — with corner protectors, softeners, or sleeves.
9. **Tag lines.** Per **A10.23 §12.17**, tag lines shall be used where necessary to control suspended loads. **Where a lift is within 20 feet of an overhead power line, tag lines shall be NON-CONDUCTIVE** — poly or nylon rope only, never wire-core, never wet manila — per **29 CFR 1926.1408(b)(2)** and 1926.1407(b)(2).
10. ESC shall maintain a **Rigging Inventory and Inspection Log** (Appendix 4-B) recording each sling, its ID, rated capacity, in-service date, and the month of each periodic thorough inspection. Rigging that fails inspection is **cut and discarded**, not set aside.

4.1.10 Overhead Power Lines During Lifting

Overhead power line contact is addressed in full in **Part 3, §3.4 (Overhead Power Lines)**. Summarized here as it applies to lifting:

1. **All power lines are presumed ENERGIZED** unless the utility owner/operator confirms the line has been **and continues to be** de-energized **and it is visibly grounded at the worksite** (1926.1408(e)). A verbal assurance that "it's dead" is worthless.
2. **The 20-foot rule (1926.1408(a)(2)):** before beginning operations, ESC determines whether any part of the equipment, load line or load (including rigging and lifting accessories) could get closer than **20 feet** to a power line. If yes, ESC must elect **Option 1** (de-energized and visibly grounded), **Option 2** (maintain 20 ft), or **Option 3** (Table A clearance based on the determined voltage). **The election is made in writing before mobilization.**
3. **Table A minimum clearance while operating:** up to 50 kV = **10 ft**; over 50 to 200 kV = 15 ft; over 200 to 350 kV = 20 ft; over 350 to 500 kV = 25 ft; over 500 to 750 kV = 35 ft; over 750 to 1,000 kV = 45 ft.
4. **Table T minimum clearance while TRAVELING with no load** (1926.1411) is **different and smaller**: up to 0.75 kV = 4 ft; over 0.75 to 50 kV = **6 ft**; over 50 to 345 kV = 10 ft. **The mast must be lowered sufficiently to meet Table T, and terrain and speed effects (bouncing over curbs and crowns) must be accounted for. ESC rule: a mast-up rig does not pass beneath a conductor. Ever. The mast is lowered, or the rig is walked on a surveyed path that never passes under a line. No travel at night or in poor visibility.**
5. **Raising or lowering the mast is assembly/disassembly (1926.1407). Per 1926.1407(c), assembly/disassembly BELOW a power line is PROHIBITED unless the utility has confirmed the line is de-energized and visibly grounded.** No spotter and no warning line cures this. Mast-up and mast-down staging locations shall be designated on the site plan, outside the swept envelope of any conductor.
6. Where Option 2 or Option 3 is used, **all** of the following are required by 1926.1408(b): a documented **planning meeting** with the operator and affected workers; **non-conductive tag lines**; an **elevated warning line, barricade or line of signs** with high-visibility flagging at the clearance offset, in view of the operator; **plus at least one** of — proximity alarm, dedicated spotter, range-limiting device, automatic warning device, or insulating link.
7. A **dedicated spotter** counts only if the spotter has a **visual aid** (painted line on the pavement, line of stanchions, line-of-sight landmarks), is positioned to gauge clearance, has **direct radio communication** with the operator, and gives timely information (1926.1408(b)(4)(ii)). **The spotter has no other duty.** The spotter does not rig, does not signal the load, does not flag traffic.
8. **ESC does not work inside the Table A zone.** 29 CFR 1926.1410 permits it only where the employer *demonstrates* that the work cannot be done outside the zone **and** that de-energizing, grounding or relocating the line is infeasible. ESC's answer to an unachievable clearance is to have the line **de-energized, relocated, or covered by the utility**, or to re-sequence the work — not to attempt a 1926.1410 procedure.
9. **Massachusetts law applies independently of OSHA, and it names ESC's equipment. M.G.L. *c.* 166, §§ 21A–21G** is a Massachusetts criminal and civil-liability statute enforced by prosecution and by the utility's civil claim — not by OSHA. The operative numbers:
   - **Six feet.** §21A defines *"in close proximity to overhead high voltage lines"* as **"within six feet of such lines."** §21B prohibits operating or erecting **"any tools, machinery or equipment, or any part thereof capable of vertical, lateral, or swinging motion"** where it is intended or necessary to bring that equipment **within six feet** of an overhead high voltage line — **except** where the line is guarded by **mechanical barriers**, or is **de-energized and grounded where necessary**, or is **temporarily relocated by mutual agreement with the utility.** §21A names **"well drilling"** and **"hoisting equipment"** by name. **There is no drill-rig carve-out in Massachusetts law.**
   - **440 volts.** §21F defines **"high voltage"** as **"a voltage in excess of four hundred and forty volts, measured between conductors, or measured between the conductor and the ground." A 277/480 V service drop — exactly what a solar carport ties into — is "high voltage" under Massachusetts law.** Do not assume a secondary conductor is outside the statute.
   - **The warning sign (§§21C, 21D, 21F).** ESC posts on the drill rig a **weather-resistant warning sign, not less than 5 inches by 7 inches, yellow background with black lettering, legible at twelve feet**, reading **"WARNING—Unlawful to operate this equipment within SIX FEET of high voltage lines."** It goes **inside the cab in plain view of the operator** and **on the outside of the machine in view of the ground crew.** §21C names **"drilling rig"** in its list of covered apparatus.
   - **The cage-type guard (§21B(3)).** An **insulated cage-type guard or other approved protective device** shall be installed about the boom or arm of hoisting equipment operated in proximity of overhead high voltage lines. **Note carefully: fitting that guard does not let ESC work any closer to the line.** 29 CFR 1926.600(a)(6)(v) says such devices **"shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation."** The guard is protection, not permission.
   - **The utility notice (§21E).** "*Before any operations are to be performed within six feet of any overhead high voltage lines, the person or persons responsible for the work to be done shall promptly notify the utility or other company owning or operating the overhead high voltage lines,*" and "*the work shall be performed only after satisfactory arrangements have been negotiated*" with that utility. **The statute does not on its face require the notice to be in writing. ESC gives it in writing anyway, as company policy**, to the utility owning the line, and retains the utility's response on site — so that both the "satisfactory arrangements" required by §21E and the **line voltage required by 29 CFR 1926.1408(c)** are documented.
   - **Penalties (§21G).** A violation is punishable by a **fine of $100 to $1,000, imprisonment for up to one year, or both** — reaching the employer **and** the individual who required or permitted the work. And if the violation results in contact, ESC is **liable to the utility for all damage AND for all liability the utility itself incurs** as a result of the contact. That second limb is an indemnity running to the utility and can far exceed the cost of a replaced conductor.
10. **Which distance governs: the greater one. Always.** Massachusetts sets a **six-foot floor**. OSHA requires **twenty feet** unless the line is de-energized and visibly grounded, or ESC has obtained the voltage from the utility and maintains the Table A distance with the full 1926.1408(b) encroachment package. **Twenty feet is greater, so twenty feet is ESC's operating limit on every site unless and until the utility provides the line voltage in writing. The six-foot figure in the Massachusetts statute is a floor, not a permission. It never authorizes ESC to work closer than the OSHA distance.** Conversely, Massachusetts imposes duties OSHA does not — the §21E notice, the §§21C/21D sign, the §21B(3) cage guard — and **ESC performs all three.**
11. **Electrical contact emergency procedure (1926.1408(g)(1)) — trained to every operator and crew member:** if the equipment contacts a line, **THE OPERATOR STAYS IN THE CAB** unless there is imminent danger of fire or explosion. If the operator must leave, he **JUMPS CLEAR** — never touching the machine and the ground at the same time — and then **SHUFFLES OR HOPS AWAY WITH FEET TOGETHER** to avoid step potential.

All other crew members stay away from the machine and the load and touch neither. A warning decal to this effect shall be posted at the operator's station (A10.23 §12.8).

4.1.11 Daily and Shift Inspections of Lifting Equipment

Per **A10.23 §10.1 and §12.2**, and 29 CFR 1926.20(b)(2):

1. **All equipment used for drilled shaft installations shall be inspected daily before use, and drilled shaft installation equipment shall be inspected at least once every shift prior to operation. THE INSPECTIONS SHALL BE DOCUMENTED.**
2. ESC's **Daily Rig / Lifting Equipment Inspection Form** (Appendix 3-A) shall include, at minimum: structural and mast condition; wire rope and winch condition; hooks, latches and rigging; hydraulic leaks; guards in place; **machine level within manufacturer tolerance, tracks fully extended, mats in place**; **overhead conductors identified, clearance verified, warning line/spotter in place**; swing radius barricaded; RAZ established; operator's manual on the machine.
3. Inspections are performed by the **Competent Person (Jean Prinsloo, CS-122896)** or by a qualified person designated in writing.
4. Any deficiency affecting safe operation results in the machine being **tagged out and removed from service** until corrected. The Competent Person has unilateral **stop-work authority**.

4.2 Material Handling, Storage and Housekeeping

4.2.1 Delivery, Offloading and Storage — 29 CFR 1926.250

1. **Load limits (1926.250(a)(1)).** Materials stored in tiers shall be stacked, racked, blocked, interlocked or otherwise secured to prevent sliding, falling or collapse. In an active parking lot, materials shall additionally be secured against being struck by a vehicle.
2. **Aisles and passageways (1926.250(a)(3)).** Aisles and passageways shall be kept clear and in good repair, with no obstruction that could create a hazard. Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made.
3. **Rebar and casing storage.** Reinforcing steel, cage sections, casing sections and drill tooling shall be stored **flat, blocked and chocked** in a designated laydown area shown on the site plan and approved by the general contractor. **Casing sections are round and will roll.** They shall be chocked on both sides.
4. **Offloading.** Rebar bundles, cage sections and casing shall be offloaded with a properly rated lifting device furnished by others and a **qualified rigger — not** with the drill rig's auxiliary winch, which is never used to offload a trailer (see §4.1.3). Employees shall stand clear of the truck bed and out from under the load. Banding shall be assumed to be under tension; band cutters and eye protection are mandatory.
5. **Manual handling.** Employees shall use mechanical assistance for loads beyond safe manual capacity. Two-person lifts and material carts are expected, not exceptional.
6. **Housekeeping (1926.25).** During the course of construction, form and scrap lumber with protruding nails, and all other debris, shall be kept cleared from work areas, passageways and stairs. Combustible scrap and debris shall be removed at regular intervals. Containers shall be provided for collection and separation of waste, trash, oily and used rags, and other refuse.
7. **Silica-generating housekeeping is separately restricted.** Per **29 CFR 1926.1153(f)**, **dry sweeping and dry brushing of drill cuttings, rock dust, saw slurry residue or concrete dust is PROHIBITED** where wet sweeping or HEPA vacuuming is feasible, and **compressed air shall NOT be used to clean surfaces, tooling, augers, drilled holes or clothing** unless used with a ventilation system that effectively captures the dust cloud. **Blowing off the auger and the tooling with the rig's air is a per-instance violation.** See the Written Silica Exposure Control Plan (**Part 2, Section 2.3**).
8. **Spoil and slurry** shall be wetted, contained and removed before it dries. On a paved, occupied lot this is simultaneously a silica control, a slip hazard control, a stormwater control and a public-relations obligation to the owner.

4.2.2 Site Cleanliness Standard

ESC's standard is that the site is left at the end of every shift in a condition in which **an unaccompanied member of the public could walk through it without being injured.** On a police station lot, that is not an abstraction — it is the actual condition that will exist at 2200 hours.

4.3 Rebar, Concrete and Concrete Equipment — 29 CFR 1926 Subpart Q

4.3.1 Impalement Protection — 29 CFR 1926.701(b)

Verbatim: "All protruding reinforcing steel, onto and into which employees could fall, shall be guarded to eliminate the hazard of impalement."

1. **Every** vertical bar, dowel, cage bar or stake onto or into which an employee could fall shall be **capped with a manufactured, impalement-rated rebar cap, or guarded by a troughed wooden cover, or bent over.** Bar ends shall not be left exposed at the end of a shift.
2. **Ordinary plastic "mushroom" caps are NOT impalement protection.** They prevent scratches. They do **not** stop a falling body and OSHA does not accept them for fall-onto exposure. ESC will use **only impalement-rated caps bearing the manufacturer's marking (steel-reinforced or OSHA-compliant impalement caps)**, or a wooden trough (2x4 laid over the bars and secured) where cap geometry does not suit.
3. **What ESC will accept as a cap.** ESC procures **only caps that carry the manufacturer's own marking identifying them as impalement-protective**, and only caps for which the manufacturer publishes an **impalement rating** (typically a steel-plate-reinforced cap tested against a falling-body impalement criterion). **The manufacturer's product data sheet for the caps actually in use is kept in the site file and is produced to the general contractor on request.** An unmarked cap, or a cap for which no manufacturer's impalement rating exists, **is not impalement protection and is not accepted on an ESC site** — it is treated as bare rebar. ESC does not name a brand in this program because the brand is a procurement decision; **the rating is the requirement, and the rating is verified against the data sheet before the caps go on the bars.**

Impalement protection in use — verified before first cage is set	Entry
Cap manufacturer and model as delivered	_____
Manufacturer's stated impalement rating	_____
Product data sheet on file and checked against the delivered product	Yes □ (initial _____) No — DO NOT USE □
Verified by (Competent Person)	_____ Date _____

1. Caps shall be **inspected daily by the Competent Person** and replaced when missing or damaged. A missing cap is a stop-work item.
2. **Cage sections stored horizontally with bars pointing outward at head height** are an impalement and laceration hazard. Cage ends shall be turned away from walkways or capped.

4.3.2 Bulk Cement, Grout and Concrete Placement — 29 CFR 1926.702

1. **Bulk cement storage (1926.702(a)(1)).** Bulk storage bins, containers and silos shall be equipped with conical or tapered bottoms and a mechanical or pneumatic vibrator or other means to prevent the bulk cement from hanging up. **(1926.702(a)(2))** Employees required to enter storage facilities shall be equipped with a lifeline and a body harness. **ESC does not enter bulk cement storage; this is noted for completeness and applies to a supplier's silo.**
2. **Concrete mixers (1926.702(b)).** Concrete mixers with one cubic yard or larger loading skips shall be equipped with a mechanical device to clear the skip of material, and with guardrails installed on each side of the skip.
3. **Handles on bull floats (1926.702(h)).** Where a bull float handle can contact energized electrical conductors, it shall be constructed of nonconductive material or insulated with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection.
4. **Concrete buckets (1926.702(f)). (f)(1)** Concrete buckets equipped with hydraulic or pneumatic gates shall have **positive safety latches or similar safety devices** to prevent premature or accidental dumping. **(f)(2)** Buckets shall be designed to prevent concrete from hanging up on the top and sides. **(1926.701(d)) "No employee shall be permitted to ride concrete buckets." (1926.701(e)(1)) "No employee shall be permitted to work under concrete buckets while buckets are being elevated or lowered into position." (1926.701(e)(2))** To the extent practical, elevated concrete buckets shall be **routed so that no employee, or the fewest number of employees, are exposed** to the hazards associated with falling concrete buckets. *(Note the paragraph letters: the "no one under the bucket" rule lives in **1926.701(e)(1)**, in the general requirements — not in 1926.703. Citing it as 1926.703 is a common and visible error.)*
5. **Tremie pipes (1926.702(g)). "Sections of tremies and similar concrete conveyances shall be secured with wire rope (or equivalent materials) in addition to the regular couplings or connections."** ESC uses tremie placement for wet-hole concrete in drilled shafts. **Every tremie section joint shall carry a secondary wire-rope restraint in addition to the coupling.** A tremie string dropping into a shaft is a fatality and a project catastrophe.
6. **Concrete pumping systems (1926.702(e)). (e)(1)** Concrete pumping systems using discharge pipes shall be provided with **pipe supports designed for 100 percent overload**. **(e)(2) Compressed air hoses used on concrete pumping systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized.**
7. **Pump line whip / blowout — the hazard behind (e)(1) and (e)(2).** A concrete pump line under pressure that separates or blocks and clears violently will **whip** with lethal force, and the discharge end will **blow out** concrete and slugs of air. ESC rules:
   - **The discharge end of the pump line and the last section of hose shall be treated as a whip zone. No employee stands in line with, or in the swing arc of, the discharge hose.**
   - **Whip-checks / safety cables shall be installed at every hose and pipe coupling** on the delivery system.
   - **The pump line shall be primed with a slurry/grout batch, never with a "dry" start,** and shall be started and stopped only by the pump operator.
   - **Blockages shall be cleared ONLY by the pump operator following the manufacturer's procedure — pressure relieved, line depressurized, coupling opened away from personnel.** Employees shall never open a coupling on a pressurized line. Employees shall never strike a pressurized line with a hammer to break a plug.

- **Line cleanout (blowing the line with air or launching a sponge/go-devil) is a high-hazard operation.** The discharge end shall be pointed into a **catch basket or capture device**, the area shall be cleared and barricaded, and only the operator shall be present at the pump.
- Boom pump setup requires **the same overhead power line clearance analysis as any other lifting machine** (see §4.1.10), **and** a designed outrigger/ground-bearing pad. A boom pump on an asphalt lot over a utility trench is a classic overturn.

8. **Concrete chutes and buggies.** Ready-mix chutes shall be supported and controlled; employees shall not position themselves under a raised chute. Chute cleanout water shall be captured, not discharged to the pavement or a catch basin.
9. **Placement sequencing at the shaft.** Concrete placement shall be sequenced so that **no employee is required to reach over an open shaft.** The shaft collar shall be guarded per **Part 3, §§3.9–3.10 (Open Shaft Protection / No-Man-Entry)**. **ESC's NO MAN-ENTRY policy is absolute: no employee enters a drilled shaft for any reason, at any time. Cleanout is by tooling only.**

4.3.3 Formwork, Shoring and Vertical Reinforcing — 29 CFR 1926.703

1. **(1926.703(a)(1))** Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting **without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.** Drawings or plans, including all revisions, for the jack layout, formwork, shoring, working decks and scaffolds, shall be available at the jobsite.
2. **(1926.703(d)(1)) — THE RULE THAT GOVERNS EVERY REBAR CAGE ESC BUILDS AND SETS.** Verbatim: **"Reinforcing steel for walls, piers, columns, and similar vertical structures shall be adequately supported to prevent overturning and to prevent collapse."** A drilled pier is expressly named. Accordingly: cages awaiting placement shall be **blocked and cribbed on their sides**, never stood on end unsecured and never leaned against a truck, a fence or the rig; and a cage set in the shaft shall be **positively supported at the collar** before rigging is released (see §4.1.5(6)). **(1926.703(d)(2))** Where wire mesh is used, measures shall be taken to prevent an unrolled roll from **recoiling** — secure the ends or turn the roll over.
3. **(1926.703(c)) Vertical slip forms — not applicable.** ESC uses no slip forms on drilled-pier work. **(1926.703(b)) Shoring and reshoring — not applicable.** ESC erects no shoring towers or reshoring on this scope. Both paragraphs are named here so the reviewer can see they were read and considered, not skipped.
4. **(1926.703(b)(1))** Where shoring equipment is ever used on an ESC project, it shall be **inspected prior to erection** to determine that it is as specified in the shoring layout, and **damaged shoring equipment shall not be used.**
5. **(1926.703(e)(1))** Forms and shores (except those on slab-on-grade and slip forms) shall **not be removed until the employer determines that the concrete has gained sufficient strength** to support its weight and superimposed loads, based on the plans/specs stipulating conditions for removal, or on properly cured test cylinders.
6. Pier cap and pedestal forms — including any **sonotube or form-tube extension** above grade on this project — shall be braced against wind, against concrete pressure at the design placement rate, and against being struck by site traffic.

4.3.4 Cement Burns, Dermatitis and Wet Concrete Contact

Wet concrete, grout and slurry are **strongly alkaline (typically pH 12–13)**. Prolonged skin contact causes **caustic chemical burns that develop with little or no immediate pain** and can progress to full-thickness injury requiring skin grafts. Cement also contains **hexavalent chromium**, a skin sensitizer causing **allergic contact dermatitis** which, once developed, is permanent and career-ending. These hazards shall be addressed in ESC's Hazard Communication program (29 CFR 1926.59 / 1910.1200) with the cement, admixture and grout **Safety Data Sheets available on site.**

Mandatory ESC controls:

1. **No skin contact with wet concrete, grout or slurry. Ever.** Employees shall wear **alkali-resistant gloves** (nitrile or rubber, not cotton or leather — leather absorbs and holds the caustic against the skin), **long sleeves and long pants**, and **waterproof boots**. Where kneeling in or near fresh concrete is unavoidable, **waterproof knee pads or kneeling boards** shall be used.
2. **Eye protection is mandatory** for all concrete placement, cleanout, tremie handling, chute handling and pump operations. Where splashing is likely, **safety goggles or a face shield over safety glasses** shall be worn.
3. **Boots and gloves shall be tall enough that concrete cannot get inside them.** Boot tops shall be covered by pant legs. Any employee who gets concrete inside a boot or glove shall **stop work immediately** and wash.
4. **Wash water shall be available at every concrete placement.** ESC will provide **clean water and pH-neutral or slightly acidic skin cleanser** at the work area (29 CFR 1926.51 sanitation requirements for potable water and washing facilities apply). **A 20-minute-capable eye flush shall be immediately available** where there is a splash risk to the eyes.
5. **First aid for cement contact:** wash the skin with clean water immediately and continuously; remove contaminated clothing, boots and gloves; for eyes, flush with clean water for **at least 15 minutes** and **seek immediate medical attention**. Report every contact incident to the Competent Person — burns that "don't hurt yet" are exactly the ones that end in a graft.
6. **Contaminated clothing shall be removed and laundered separately.** Employees shall not wear concrete-soaked clothing for the rest of the shift.
7. Concrete placement is a **silica-containing** operation for housekeeping purposes once it dries; slurry and spillage shall be cleaned up **wet, before it dries**, per 29 CFR 1926.1153(f).

4.4 Excavation and Trenching — 29 CFR 1926 Subpart P

Applies to ESC's test pits, utility soft-digs / hand-digs, pier collar excavations, obstruction removals and any pit, well or shaft ESC opens.

4.4.1 Competent Person

Per **29 CFR 1926.651(k)(1)**, **daily inspections of excavations, the adjacent areas and protective systems shall be made by a competent person** for evidence of a situation that could result in cave-ins, failure of protective systems, hazardous atmospheres or other hazardous conditions. **Inspections shall be conducted prior to the start of work and as needed throughout the shift**, and **after every rainstorm or other hazard-increasing occurrence.** Per **1926.651(k)(2)**, where the competent person finds evidence of a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, **exposed employees shall be removed from the hazardous area until the necessary precautions have been taken.**

ESC's designated Excavation Competent Person is JEAN PRINSLOO — Site Superintendent, Massachusetts Construction Supervisor License CS-122896, support@earthsupportcorp.com — who has full authority to stop work and to order employees out of any excavation. **A competent person without stop-work authority is not a competent person; Jean Prinsloo has it, unconditionally, and no ESC supervisor may overrule him.**

Alternate / backup Competent Person: DEREK SNOW — Treasurer, support@earthsupportcorp.com. Derek Snow is also the person to whom every stop-work escalation goes. **ESC is a company of ten or fewer employees and names no one it does not have: there is no separate safety director, and these two individuals are the program's whole chain of authority.** The Competent Person on duty for a given shift signs the Daily Excavation Inspection Form (Appendix 5-C) — **Competent Person on duty this shift:** _____ **Date:** _____

4.4.2 Underground Utilities — 29 CFR 1926.651(b)

1. **(b)(1)** The estimated location of utility installations — sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work — **shall be determined prior to opening an excavation.**
2. **(b)(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.**

In Massachusetts this is Dig Safe, and it is statutory. ESC **premarks** the excavation area in **white** (M.G.L. c. 82, §40; 220 CMR 99.03(1) — *"An excavator shall premark an excavation site before giving notice"*), then files a Dig Safe notice with **Dig Safe System, Inc. — 811 or 1-888-DIG-SAFE (888) 344-7233** — **not less than 72 hours, exclusive of Saturdays, Sundays and legal holidays, and not more than 30 days** before excavation (M.G.L. c. 82, §40A; 220 CMR 99.04(1)). **Excavation may not commence within 72 hours after notification** (220 CMR 99.07(1)). **The ticket is valid 30 calendar days from the date of notification, and only so long as the markings remain clear and discernible** (220 CMR 99.07(2)) — **obliterated marks void the ticket even inside 30 days, and it is ESC's job, not the utility's, to maintain or offset them** (220 CMR 99.07(4)). **"72 hours excluding weekends and holidays" is not "3 calendar days":** call Monday morning, dig Thursday morning at the earliest. **Digging without the ticket is prima facie evidence of negligence if anything is damaged** (M.G.L. c. 82, §40C). Renew by calling a fresh notice at least 72 business hours before day 30 expires, so there is no gap.

Dig Safe record — completed in the field	Entry
All pier locations premarked in white — date	_____
Dig Safe notice called / e-ticket filed — date and time	_____
Dig Safe ticket no. (assigned by the Dig Safe Center at the time of the call)	_____
Earliest lawful start (72 hrs excl. Sat/Sun/holidays)	_____
Ticket expires (30 calendar days from notification)	_____
Marks received / "clear" responses received from all member companies	_____
Called in by	_____

1. **Dig Safe does not mark anything, and it does not touch the private lines — which on this site are the real risk.** Verbatim from digsafe.com: **"Dig Safe is a notification center and does not mark lines."** Member companies mark only **their own** facilities, and only **up to the meter / point of ownership transfer.** Everything behind the meter on a municipal public-safety campus — **standby generator feeders and fuel line, site and parking-lot lighting circuits, fire-service water and hydrant leads, fire alarm and security and card-access conduit, the emergency-dispatch communications duct bank, signal-preemption loops at the**

apparatus apron, irrigation, private drainage, and existing PV/EV conduit — is **invisible to the 811 ticket. Cutting an emergency-dispatch duct bank at a public-safety facility can take a town's 911 out of service.** ESC therefore procures, in addition to the mandatory ticket:

- **The owner's and general contractor's site-utility and as-built drawings, and a written statement of known private utilities.** A verbal "there's nothing there" is worthless — it is ASCE 38 Quality Level D and ESC does not drill on it.
- **A private utility locate (electromagnetic locate plus GPR sweep) of every pier location and of the rig access and set-up path**, engaged by ESC or by the GC. ESC's standing private-locate vendor is **GPRS — Ground Penetrating Radar Systems, Boston — (617) 448-8098, massachusettsinfo@gprsinc.com** (private utility locating, concrete scanning, GPR).
- **Vacuum potholing to physically expose and confirm horizontal AND vertical position (ASCE 38 Quality Level A) at every pier where any facility, public or private, is indicated within or near the shaft footprint plus its safety zone. A QL-B geophysical locate gives horizontal position with no depth and cannot detect a non-conductive poly or PVC line with no tracer wire. QL-B is not clearance. Only physical exposure is clearance.**

Private locate record	Entry
Private locate vendor	**GPRS — Ground Penetrating Radar Systems, Boston — (617) 448-8098**
Locate performed — date	_____
Locate report / sketch reference no.	_____
Owner/GC written statement of known private utilities received — date	_____
Vacuum test holes (QL-A) completed at piers	_____
Written dig clearance signed by the general contractor before each pier is drilled	_____

The pier locations requiring soft-dig, the facilities indicated at each, and the protected exclusion areas (leach fields, stormwater basins, wetlands, drainage structures) are listed on the project's own copy of this section before mobilization, and are marked on the posted site plan.

1. **(b)(3)** When excavation operations approach the estimated location of underground installations, **the exact location shall be determined by safe and acceptable means.**
2. **(b)(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.**
3. **ESC's soft-dig rule — and it is set by statute, not by preference.** Massachusetts defines the **SAFETY ZONE** (its name for the tolerance zone) at **M.G.L. c. 82, §40** as a zone containing **"the width of the facilities plus not more than 18 inches on each side."** The paint mark on the ground is the **center line** of the facility, not its edge (220 CMR 99.06(2), center-line method) — so the zone is measured **18 inches horizontally beyond each outer edge** of the facility, i.e. from the marked center line plus half the facility width. Because a marked line does not disclose the facility's true width or its lateral wander, **ESC treats the safety zone as a minimum of 18 inches each side of the outer edge of the largest plausible facility consistent with the mark.**

Inside the safety zone, mechanical excavation is PROHIBITED. An auger is mechanical means. It does not turn inside a safety zone — ever. Per **220 CMR 99.07(3)**, non-mechanical means shall be employed as necessary to avoid damage in locating the facility, and **mechanical equipment may be used only for the initial penetration of pavement or rock — after which non-mechanical means must be used.** Massachusetts statutorily defines **"non-mechanical means"** at M.G.L. c. 82, §40 to include **"air vacuum, air blowing or similar methods of excavation"** — so **vacuum excavation satisfies the requirement.** ESC does not have to hand-shovel a 36-inch pier; it vacuum-excavates it. Location shall be by **vacuum excavation (air-vacuum / air-blow / hydro), hand digging with insulated tools, or other non-destructive means only.** The auger does not turn until the utility is exposed, verified, and its clearance from the pier is documented.

Where the general contractor, the owner, or an owning utility specifies a standoff GREATER than the statutory safety zone, the greater standoff governs. The Competent Person records the governing standoff for each pier on the dig clearance before the pier is drilled. **Governing standoff applied on this project (statutory safety zone, or greater if imposed):** _____ **Imposed by:** _____

1. **Every buried utility conflict is reported immediately, in writing, to the general contractor and the owner.** ESC will not "work around" a conflict on a verbal instruction from anyone.

4.4.3 Access, Egress and Surface Encumbrances

1. **(1926.651(a))** All surface encumbrances that are located so as to create a hazard shall be removed or supported as necessary to safeguard employees.
2. **(1926.651(c)(2)) A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.** Ladders shall extend **at least 3 feet above the upper landing surface** and shall be secured (1926.1053(b)(1)).
3. Structural ramps used by employees shall be designed by a competent person; ramps used by equipment shall be designed by a competent person qualified in structural design (1926.651(c)(1)).

4.4.4 Soil Classification and Protective Systems — 1926.652 and Appendix A

1. **(1926.652(a)(1)) Each employee in an excavation shall be protected from cave-ins by an adequate protective system** designed in accordance with 1926.652(b) or (c), **except** when (i) excavations are made **entirely in stable rock**, or (ii) excavations are **less than 5 feet in depth** and examination of the ground by a competent person provides no indication of a potential cave-in.
2. **ESC treats 5 feet as a ceiling, not a target.** No ESC employee enters an unprotected excavation deeper than 4 feet without the Competent Person's written determination.
3. **Soil classification.** The Competent Person shall classify the deposits as **Stable Rock, Type A, Type B or Type C** using **at least one visual and at least one manual analysis** per **29 CFR 1926 Subpart P Appendix A**. **Any soil that is submerged, that is freely seeping water, that is fissured, that has been previously disturbed, or that is subject to vibration from traffic or heavy equipment must be classified NO BETTER THAN TYPE C** (Appendix A(b), definitions and (d)). **A parking lot excavation adjacent to a utility trench and subject to vehicle vibration is, in practice, Type C.**
4. **Sloping/benching (Appendix B):** Type C soil requires a maximum allowable slope of **1½ H : 1 V (34 degrees)**. Type B: 1H:1V (45°). Type A: ¾H:1V (53°). **Benching is not permitted in Type C soil.**
5. **Shoring/shielding (1926.652(c)):** Where sloping is not practicable — and in a confined parking lot it usually is not — ESC will use a **manufactured trench box or hydraulic shoring installed and used in accordance with the manufacturer's tabulated data**, which shall be **kept on site** (1926.652(c)(2)(ii) and (c)(3)). **Employees shall not be in the trench box during installation, removal or vertical movement (1926.652(g)(2)).**
6. **Soil classification and protective system for each excavation shall be recorded on the Daily Excavation Inspection Form (Appendix 5-C).**

4.4.5 Spoil, Materials and Equipment Setback — 1926.651(j)

Verbatim (1926.651(j)(2)): "Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) 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."

1. **Spoil, drill cuttings, tooling, casing, cage sections, hoses and equipment shall be kept a minimum of 2 feet back from the edge of any excavation — and, as ESC practice, a distance at least equal to the depth of the excavation wherever the site allows**, because a spoil pile within 2 feet still **surcharges** the wall.
2. **(1926.651(j)(1))** Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection consists of **scaling to remove loose material, installation of protective barricades at intervals as necessary on the face, or other means that provide equivalent protection.**
3. **Heavy equipment — including the drill rig and the concrete pump truck — shall not be positioned so that its bearing pressure surcharges an open excavation or trench.** Where equipment must operate near an excavation, the Competent Person shall determine the required setback, and the excavation shall be shored or shielded.

4.4.6 Water Accumulation and Hazardous Atmospheres

1. **(1926.651(h)(1))** Employees shall not work in excavations in which there is accumulated water, or in which water is accumulating, unless adequate precautions have been taken. **(h)(2)** If water is controlled or prevented by water removal equipment, the water removal equipment and operations **shall be monitored by a competent person. (h)(3)** If excavation work interrupts natural drainage of surface water, diversion ditches, dikes or other means shall be used.
2. **Groundwater is a known condition on ESC's work. Temporary casing, dewatering and slurry are the engineering answer; a pump running with nobody watching it is not.**
3. **(1926.651(g)(1)(i))** Where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist — such as in excavations in landfill areas, excavations in areas where hazardous substances are stored nearby, or **excavations more than 4 feet in depth — the atmosphere in the excavation shall be tested before employees enter.** Flammable gas shall be kept **below 20% of the lower flammable limit. (g)(2)** Emergency rescue equipment — **breathing apparatus, a safety harness and line, or a basket stretcher** — shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop, and shall be attended when in use.
4. **ESC's NO MAN-ENTRY policy for drilled shafts eliminates the worst case entirely.** No ESC employee enters a drilled shaft. Cleanout is by tooling only. See **Part 3, §§3.9–3.10 (Open Shaft Protection / No-Man-Entry)**.

4.4.7 Fall Protection at Excavations and Open Holes

Per **29 CFR 1926.501(b)(7)(ii)**, each employee at the edge of a **well, pit, shaft or similar excavation 6 feet or more in depth** shall be protected from falling by **guardrail systems, fences, barricades, or covers.** Per **29 CFR 1926.501(b)(4)(ii) and (iii)**, employees shall be protected **from tripping in or stepping into or through holes, and from objects falling through holes, by COVERS** — with **no** depth trigger and **no** alternative to a cover. Cover criteria are at 29 CFR 1926.502(i). **See Part 3, §§3.9–3.10 (Open Shaft Protection / No-Man-Entry) for the full treatment, including the critical requirement at 1926.502(i)(1) that covers in roadways and vehicular aisles support at least TWICE THE MAXIMUM AXLE LOAD of the largest vehicle expected to cross them — which on a public-safety campus means a responding fire apparatus, not a passenger car.**

4.5 Hand and Power Tools — 29 CFR 1926 Subpart I

1. **(1926.300(a))** All hand and power tools and similar equipment, **whether furnished by the employer or the employee, shall be maintained in a safe condition.** ESC inspects employee-owned tools brought to site and will remove unsafe tools from service.
2. **Guarding (1926.300(b)(1)). When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use. (b)(2)** Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating or moving parts of equipment shall be guarded if such parts are exposed to contact by employees or otherwise create a hazard. **Removing, defeating, wiring back or "temporarily" pinning a guard is a terminable offense at ESC.**
3. **Point of operation guarding (1926.300(b)(2)); abrasive wheels (1926.303).** Abrasive wheels shall be used only on machines provided with safety guards (1926.303(c)(1)). **Before mounting, the wheel shall be closely inspected and sounded (ring test) to make sure it has not been damaged, and the wheel speed shall be checked against the spindle speed to be certain the safe surface speed is not exceeded** (1926.303(c)(7)). Grinding wheel guards shall have maximum exposure angles per 1926.303(b)(2).
4. **Switches (1926.300(d)).** Hand-held powered circular saws with blades greater than 2 inches, 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. **Hand-held powered drills, tappers, fastener drivers, horizontal/vertical/angle grinders with wheels greater than 2 inches, disc and belt sanders, reciprocating saws, saber/scroll/jig saws with blade shanks greater than ¼ inch, and other similar tools** shall be equipped 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(s) that turn it on.
5. **Electric power-operated tools (1926.302(a)).** Shall be **either of the approved double-insulated type or grounded** in accordance with Subpart K. See §4.6.
6. **Pneumatic power tools (1926.302(b)). (b)(1)** Pneumatic power tools shall be **secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected. (b)(2) Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled. (b)(3)** All hoses exceeding ½-inch inside diameter shall have a **safety device at the source of supply or branch line to reduce pressure in case of hose failure** (an excess-flow valve / "safety check valve"). **(b)(7) 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. NOTE: On ESC sites this is further and more strictly restricted by 29 CFR 1926.1153(f)(2), which PROHIBITS compressed air for cleaning surfaces or clothing where it could contribute to silica exposure unless paired with an effective dust-capturing ventilation system. The silica rule governs. Do not blow off the auger, the tooling, the rig deck, drilled holes, or your clothes.**
7. **Whip-checks / hose restraints shall be installed at every air hose coupling** and at every concrete pump line coupling (see §4.3.2). A separated pressurized hose whips with lethal force.
8. **Hydraulic power tools (1926.302(d)).** The fluid used shall be fire-resistant and shall retain its operating characteristics at the most extreme temperatures. The manufacturer's safe operating pressure for hoses, valves, pipes, filters and fittings shall not be exceeded. **Hydraulic fluid injection injury is a surgical emergency** — a pinhole leak can inject fluid through skin. **Employees shall never search for a hydraulic leak with their hands.** Use cardboard. Any suspected injection injury goes to the emergency department **immediately**, with the fluid SDS.
9. **Powder-actuated tools (1926.302(e)).** Only employees who have been **trained in the operation of the particular tool in use shall be allowed to operate it (1926.302(e)(1))**, and shall carry the manufacturer's certificate/card. The tool shall be tested each day before loading (e)(2); shall not be loaded until just prior to intended firing (e)(6); shall not be left unattended while loaded (e)(6); and shall not be used in an explosive or flammable atmosphere (e)(5). **ESC's drilled-pier scope requires no powder-actuated fastening, and NO POWDER-ACTUATED TOOL IS USED ON THIS PROJECT.** The rule is written here anyway so that it is already in force if one is ever introduced on an ESC project: **a powder-actuated tool may be brought onto an ESC site only with the prior written authorization of the Competent Person (Jean Prinsloo, CS-122896), and may be operated only by an employee trained on that particular tool and carrying the manufacturer's card on his person.** There is no field-level authority to introduce one.
10. **Chipping hammers, jackhammers, rotary hammers, saws and grinders are ALSO silica-generating tools** and must be run with the engineering controls required by **29 CFR 1926.1153 Table 1** (integrated water delivery, or shroud + dust collector meeting the specified airflow and filter criteria), with the 4-hour aggregation rule applied. See the Written Silica Exposure Control Plan (**Part 2, Section 2.3**). **A tool that is compliant under Subpart I but not under 1926.1153 is not compliant.**
11. **Tools shall not be raised or lowered by their cords or hoses (1926.416(e)(2)).** Use a hand line or a bucket.
12. **PPE for tool use:** eye protection (ANSI Z87.1) at all times; hearing protection where noise exceeds the 1926.52 action level; cut-resistant gloves; face shield in addition to safety glasses for grinding, chipping and cutting.

4.6 Electrical Safety and Ground-Fault Protection — 29 CFR 1926 Subpart K

4.6.1 General

1. **(1926.416(a)(1)) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.**
2. **(1926.416(a)(3)) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the hazards involved, and the protective measures to be taken. This is the cite that mandates ESC's documented pre-job overhead line survey and buried-utility locate — see §4.1.10 and §4.4.2.**
3. **(1926.600(a)(6))** For mechanized equipment operating near energized lines rated **50 kV or below, minimum clearance between the lines and any part of the equipment or load shall be 10 feet.** For lines over 50 kV: 10 feet plus 0.4 inch per kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet. **A person shall be designated to observe clearance and give timely warning** for all operations where it is difficult for the operator to maintain clearance by visual means.
4. **Only qualified persons** shall work on energized electrical equipment. **ESC employs no qualified electrical workers and performs no electrical work.** All electrical installation, temporary power, and any work on or near energized parts is performed by the general contractor's licensed electrician. ESC's role is limited to **safe use of temporary power** and **maintaining clearance.**

4.6.2 Ground-Fault Protection — 29 CFR 1926.404(b)(1)

Per 1926.404(b)(1)(i), the employer shall use **either** ground-fault circuit interrupters **or** an assured equipment grounding conductor program to protect employees on construction sites. **ESC uses GFCI protection as the primary method.**

GFCI (1926.404(b)(1)(ii)): All 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites which are not 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 5 kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be GFCI-protected.

ESC rules:

1. **Every 120V hand tool, extension cord, light and pump used by ESC runs through a GFCI** — either a GFCI receptacle, a GFCI circuit breaker, or a **portable in-line GFCI plugged in at the source (not at the tool end)**.
2. **GFCIs shall be tested (press TEST, confirm trip, press RESET) before each shift's use and the test recorded** on the daily inspection form.
3. **Water and electricity are combined on every silica-wet task ESC performs** — wet core drilling, wet sawing, wet chipping, slurry vacuuming. **Per OSHA Fact Sheet OSHA3929, GFCI protection and watertight, sealable connectors are required where water is used with electric tools.** No exceptions. A wet cord end in a puddle on an asphalt lot is a fatal shock.
4. Where an **assured equipment grounding conductor program** is used instead (e.g., a GC-mandated program), it shall meet 1926.404(b)(1)(iii) in full: a **written description** of the program available at the jobsite; **a competent person to implement the program**; **continuity testing of each cord set, receptacle not part of the permanent wiring, and cord- and plug-connected equipment** before first use, after any repair, after suspected damage, and **at 3-month intervals**; **correct attachment testing** of the equipment grounding conductor; and **color-coded tapes marking each tested item, with records maintained and available.**

4.6.3 Cords, Cables and Temporary Wiring

1. **(1926.405(a)(2)(ii)(J)) Flexible cords used with temporary and portable lights shall be designed for hard usage or extra-hard usage.** ESC uses only **SO, SOW, SOOW, STW or equivalent hard-service cord.** Household-grade cord (SPT, SJ, orange "indoor" cord) is prohibited on ESC sites.
2. **(1926.405(g)(2)(i))** Worn or frayed electric cords or cables shall not be used. **(g)(2)(ii))** Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.
3. **(1926.405(a)(2)(ii)(I))** All lamps for general illumination shall be protected from accidental contact or breakage; metal-case sockets shall be grounded.
4. **(1926.405(j)(1)(iv))** Receptacles for attachment plugs shall be of the approved, concealed-contact type. **Where different voltages, frequencies or types of current are supplied, receptacles shall be of such design that attachment plugs are not interchangeable.**
5. **Cords crossing vehicle or pedestrian routes shall be protected by a cord ramp or suspended overhead at height** — in an active parking lot this is mandatory, not optional. A cord run under a cruiser tire is both a shock hazard and a trip hazard.
6. **Missing ground pins are a stop-work item. Cords with a cut, splice, taped repair, or exposed conductor are cut and discarded**, not "wrapped and used until Friday."
7. **(1926.403(b)(2))** Listed, labeled or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling or certification.
8. **(1926.416(b)(1))** Worn or frayed cables shall not be used; **(1926.416(e)(1))** worn or frayed electric cords or cables shall not be used.
9. **(1926.417) Lockout/tagout:** controls that are to be deactivated during the course of work on energized or de-energized equipment or circuits **shall be tagged**; equipment or circuits that are de-energized **shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.** ESC employees shall not operate any switch, breaker, valve or control bearing another employer's lock or tag.

4.7 Ladders and Stairways — 29 CFR 1926 Subpart X

1. **(1926.1051(a))** A stairway or ladder shall be provided at **all personnel points of access where there is a break in elevation of 19 inches or more**, and no ramp, runway, sloped embankment or personnel hoist is provided.

2. **(1926.1053(b)(1)) When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet above the upper landing surface.** Where such an extension is not possible, the ladder shall be secured at its top to a rigid support and a grasping device provided.
3. **(1926.1053(b)(4))** Ladders shall be used only for the purpose for which they were designed. **(b)(5)(i) Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the 4:1 rule).**
4. **(1926.1053(b)(6))** Ladders shall be used only on **stable and level surfaces** unless secured to prevent accidental displacement. **(b)(7)** Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet.
5. **(1926.1053(b)(11)) Ladders shall not be moved, shifted or extended while occupied.**
6. **(1926.1053(b)(12))** Ladders with **conductive side rails shall not be used** where the ladder or a person on it could contact exposed energized electrical equipment. **ESC uses fiberglass ladders only.**
7. **(1926.1053(b)(15)) Ladders shall be inspected by a competent person for visible defects on a periodic basis and after any occurrence that could affect their safe use. (b)(16)** Portable ladders with structural defects shall be **immediately marked "DO NOT USE" or tagged, and withdrawn from service** until repaired.
8. **(1926.1053(b)(20)) Employees shall face the ladder when progressing up or down. (b)(21) Employees shall use at least one hand to grasp the ladder when progressing up or down. (b)(22) An employee shall not carry any object or load that could cause the employee to lose balance and fall.** Tools and materials go up in a bucket on a hand line, not in a hand.
9. **(1926.1053(b)(2))** Ladders shall not be loaded beyond the maximum intended load nor beyond their manufacturer's rated capacity. **ESC uses Type IA (300 lb) or Type IAA (375 lb) duty-rated ladders.**
10. **(1926.1060(a))** The employer shall provide a **training program** for each employee using ladders and stairways, given by a **competent person**, covering the nature of fall hazards; the correct procedures for erecting, maintaining and disassembling the fall protection systems to be used; the proper construction, use, placement and care in handling of ladders and stairways; the maximum intended load-carrying capacities; and the standards in Subpart X. **Retraining is required whenever necessary (1926.1060(b)).**
11. **A ladder is not a work platform.** Where extended work at height is required, ESC will use a scaffold, an aerial lift, or a designed platform.
12. **Ladder access into an excavation** shall comply with 1926.651(c)(2) — see §4.4.3.

4.8 Work Zone and Traffic Control — Active, Occupied Sites

This section is the highest-consequence section in this Part for the work ESC actually does. ESC's projects are frequently within, or immediately adjacent to, **facilities that remain in full operation during construction** — including occupied institutional, municipal and public-safety campuses, where **vehicles may respond under emergency conditions, and public visitors and facility staff move through and around the work area around the clock.**

4.8.1 Governing Requirements

1. **(29 CFR 1926.200(g)(2)) "Signs and symbols required by this subpart shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazards no longer exist."**
2. **(29 CFR 1926.200(g)(1))** Construction areas shall be posted with legible traffic signs at points of hazard.
3. **(29 CFR 1926.201(a)) "Signaling directing traffic. When signs, signals, and barricades do not provide necessary protection on or adjacent to a highway or street, flaggers or other appropriate traffic controls shall be provided."** OSHA incorporates by reference the **Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), Part 6 (Temporary Traffic Control)**, and **ANSI/ISEA 107** high-visibility apparel, per 1926.200(g)(2) and 1926.201(a).
4. **(29 CFR 1926.202) "Barricades for protection of employees shall conform to the portions of the American National Standard Institute D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways, relating to barricades."**
5. **(23 CFR 634)** All workers exposed to traffic or to construction equipment within the work zone **shall wear high-visibility safety apparel meeting ANSI/ISEA 107 Class 2 or Class 3.**
6. **Police details and road flaggers — 700 CMR 6.00.** The MassDOT regulation governing this is **700 CMR 6.00, *Use of Road Flaggers and Police Details on Public Works Projects*** (administered in consultation with EOPSS). *(Note the citation: it is 700 CMR 6.00. The older Executive Office of Transportation numbering, 701 CMR 7.00, still circulates in contractor literature and is wrong.)* Civilian flaggers have been lawful in Massachusetts on qualifying projects since 2008; a flagger must be **18 or older, trained in work-zone safety, traffic control and first aid, and must carry a valid MassDOT-approved certification card on his person.**

How it actually works, and how ESC runs it. ESC's drilled-pier work is normally performed **on the owner's own lot, inside the property line — not in the travel lanes of the public way. Any operation that reaches the public way, however — a ready-mix delivery staged from the street, a lowbed mobilizing or demobilizing the drill rig, or any lane or sidewalk encroachment — triggers a traffic-control requirement, and the determination of whether that requirement is met by a police detail or by a certified flagger is made by the local police department with jurisdiction, not by ESC.** The contractor performing the work requests the detail from that department's business line *(the non-emergency line; emergencies are 911)*, and the contractor pays for it, normally as a contract line item. Detail rates and minimum-hour rules are set by the department; **ESC obtains the current rate, the required lead time and the minimum-hour rule directly from the department when the request is placed, and records them below.**

ESC confirms in writing with the general contractor, before mobilization, whether traffic control on the project sits in the GC's scope or in ESC's — and does not assume. The written answer is recorded here and the detail is booked against it.

Traffic control — confirmed before mobilization	Entry
Police department with jurisdiction, and its business line	_____
Operations reaching the public way (mobilization, deliveries, lane/sidewalk encroachment) — identified and listed	_____
Department determination: police detail required / certified flagger acceptable	_____
Required lead time to book a detail (obtained from the department)	_____
Minimum-hour rule and current detail rate (obtained from the department)	_____
Detail/flagger in GC's scope or ESC's — written answer from the general contractor, date	_____
Confirmed by	_____ Date _____

4.8.2 ESC's Internal Traffic Control Plan (ITCP)

Before mobilization, ESC will prepare a written Internal Traffic Control Plan and submit it to the general contractor and the facility owner for approval. The ITCP shall be a **marked-up site plan** showing:

1. **The hard-barricaded work zone** — the full area within which ESC equipment operates, including the drill rig, its **entire swing radius**, the auger **spin-off arc**, the spoil pile, the casing and cage laydown, the concrete truck/pump position, and all open or covered shafts.
2. **The vehicle exclusion line. This zone shall be delineated with HARD BARRIER — water-filled or concrete barrier, or equivalent — NOT cones and caution tape alone.** Cones stop a courteous driver. They do not stop an emergency vehicle responding to a call, and they do not stop a distracted member of the public. **Physically excluding vehicles from the shaft area is also what allows ESC's shaft covers to be designed to the 1926.502(i)(2) criterion (twice the weight of employees, equipment and materials) rather than the 1926.502(i)(1) criterion (twice the maximum axle load of the largest vehicle expected to cross) — which on a site carrying emergency-vehicle traffic would otherwise mean designing the cover for a responding fire apparatus.** See §4.4.7 and the Open Shaft / No-Entry Program.
3. **Designated equipment travel routes and turnaround/backing areas**, segregated from public and police vehicle routes.
4. **Designated pedestrian routes** for police personnel, staff and the public — **physically separated from the work zone and from equipment travel routes**, with a firm, stable, slip-resistant surface, adequate width, and **protected from falling and swinging loads.** Pedestrians shall never be routed under a suspended load, through a swing radius, or across an equipment travel route.
5. **Delivery routing, staging and check-in point** for ready-mix, rebar and casing deliveries, with an ESC spotter meeting every truck at the gate.
6. **Emergency access. Every emergency access and egress route serving the site and its occupants shall remain open at all times.** ESC's work zone shall be laid out so that **no ESC equipment, material, hose, cord or open excavation ever blocks an emergency access route or a building exit.** Where a phase of work would encroach on such a route, ESC will obtain **written** approval and an agreed alternate route from the authority having jurisdiction and the facility owner before that phase begins.
7. **Signage** — advance warning signs, "CONSTRUCTION AREA — AUTHORIZED PERSONNEL ONLY," "DANGER — OPEN EXCAVATION," "DANGER — OVERHEAD LOADS," directional and detour signage, all conforming to MUTCD Part 6 and removed or covered when the hazard no longer exists per 1926.200(g)(2).

Internal Traffic Control Plan sign-off (completed before mobilization; the GC of record is named on the counterparty block at Section 1.4.6):

Step	Name (print)	Signature	Date
ITCP prepared by (ESC)			
Submitted to / approved by the general contractor			
Approved by the police department with jurisdiction / facility representative			

4.8.3 Coordination With the Facility and the Owner

Per **ANSI/ASSP A10.23 §6.2.3**, where workers of other contractors, owner representatives, or the public enter the Restricted Access Zone without approval, **the drilled shaft contractor shall promptly inform the project constructor or site owner of the intrusions, and the project constructor or site owner shall take reasonable steps to prevent such intrusions.**

ESC will therefore, **as a condition of the bid**:

1. Obtain a **written agreement with the general contractor and the facility owner** covering lot closure or partial closure, the phasing of parking spaces taken out of service, traffic routing, pedestrian routing, and **who provides police details or flaggers and who pays for them.**
2. Hold a **pre-construction coordination meeting** with the GC, the facility representative and the department's operational command before mobilization, and document it. Per **A10.23 §6.1.3**, the project constructor is required to organize and conduct a pre-construction meeting with the drilled shaft contractor to review the site-specific safety plan.
3. Establish a **direct, named point of contact and a phone number** at the facility for daily coordination and for immediate notification of a change in the work zone. **The facility contact is a named individual designated by the owner and the occupying department at the pre-construction coordination meeting; ESC records the name and the direct number below and posts it at the rig and in the truck before the first shift.** ESC does not print a name it has not been given. Until the individual is designated, the occupant's published business lines govern and are written on the site emergency card. **Those are business/non-emergency lines. Every emergency is 911.**

Facility point of contact — recorded at the pre-construction meeting	Entry
Name (print)	_____
Title / department	_____
Direct phone (daily coordination)	_____
After-hours / duty-officer phone	_____
Posted at the rig and in the truck by	_____ Date _____

1. **Log every intrusion into the work zone in writing and report it to the GC the same day.** ESC will not tolerate an unmanaged work zone. If intrusions continue after written notice, the Competent Person will **stop work** until the condition is corrected.

4.8.4 Flaggers and High-Visibility Apparel

1. **Flaggers shall be trained and shall use STOP/SLOW paddles conforming to MUTCD Part 6.** Hand signaling by flaggers shall conform to 1926.201(a).
2. **Every ESC employee on site shall wear ANSI/ISEA 107 Class 2 high-visibility apparel at all times. Class 3 apparel shall be worn by flaggers, spotters, and any employee working in or adjacent to a live vehicle route, and by all employees during hours of darkness or reduced visibility.**
3. **Hi-vis apparel shall be kept clean and shall be replaced when faded, torn or soiled to the point that the retroreflective material no longer performs.** A concrete-covered vest is not a hi-vis vest.
4. A **flagger's or spotter's ONLY duty is traffic or clearance control.** They do not rig, do not signal loads, do not hold a shovel, and do not look at a phone.
5. Flagger/spotter stations shall have an **escape route** identified — a place to go if a vehicle fails to stop.

4.8.5 Site Vehicles, Mobile Equipment and Backing — 29 CFR 1926.600 and 1926.601

1. **(1926.601(b)(4)(i)) "No employer shall use any motor vehicle equipment having an obstructed view to the rear unless: (i) The vehicle has a reverse signal alarm audible above the surrounding noise level or: (ii) The vehicle is backed up only when an observer signals that it is safe to do so."**
2. **ESC's rule is stricter than OSHA's, because a back-over in an occupied parking lot kills a member of the public, not just a worker: EVERY backing movement of ESC equipment or an ESC-directed delivery vehicle within the work zone shall be guided by a DEDICATED SPOTTER in direct communication with the driver, IN ADDITION to a functioning reverse alarm.** The spotter shall remain **visible in the driver's mirror at all times**; if the driver loses sight of the spotter, **the driver stops immediately.**
3. **Wherever practicable, ESC will eliminate backing altogether by laying out the work zone for drive-through / pull-forward movement.** Elimination beats a spotter.
4. **(1926.601(b)(3))** All vehicles shall have an **audible warning device (horn) at the operator's station in an operable condition. (b)(2))** Vehicles shall have a **service brake system, an emergency brake system, and a parking brake system**, all maintained in operable condition. **(b)(5))** All vehicles with cabs shall be equipped with **windshields and powered wipers**; cracked and broken glass shall be replaced. **(b)(9)) Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried, and seat belts (b)(6) shall be installed and used.**
5. **(1926.600(a)(3)(i)) "All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of the equipment."**
6. **(1926.600(a)(3)(ii)) "A safety tire rack, cage, or equivalent protection shall be provided and used when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices."**
7. **(1926.600(a)(6))** Minimum clearance from energized lines — see §4.6.1.
8. **(1926.601(b)(14)) "All vehicles in use shall be checked at the beginning of each shift to assure that all parts, equipment, and accessories that affect safe operation are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service."** These inspections shall be **recorded**.
9. **Equipment shall be shut down, the attachment lowered to the ground, controls neutralized, the parking brake set, and the key removed** whenever the operator leaves the station. Tracks shall be chocked on any grade.
10. **No riders.** No employee shall ride on equipment, on a load, on running boards, on a trailer hitch, in a bucket, on the drill rig deck, or anywhere other than a designated seat.
11. **Speed limit within the work zone and the lot: 5 MPH.** This is ESC's own rule and ESC enforces it on every ESC vehicle, every lower-tier subcontractor vehicle and every delivery vehicle ESC directs. **Where the owner, the facility occupant or the general contractor posts or imposes a LOWER limit anywhere on the site, the lower limit governs and ESC works to it.** ESC never claims the benefit of a higher one. The limit is stated at the delivery check-in and is posted at the work-zone entrance.
12. **Concrete truck movements are the highest-frequency vehicle hazard on this work.** Every ready-mix truck shall be **met at the gate, escorted in, and spotted through every backing movement.** The truck shall be **chocked** while discharging. No employee positions himself between the truck and any fixed object, barrier or open shaft.

4.9 Fire Prevention, Fueling and Flammable Liquid Storage

4.9.1 Fire Protection Program — 29 CFR 1926.150 and 1926.24

1. **(1926.24)** The employer shall comply with the applicable requirements of 29 CFR 1926.150 through .155, and shall **establish a fire protection program to be followed throughout all phases of the construction work.** ESC shall provide **firefighting equipment as specified**, and it shall be **conspicuously located** and **maintained in operating condition. Defective equipment shall be immediately replaced.**
2. **(1926.150(c)(1)(i)) "A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet."**
3. **(1926.150(c)(1)(vi)) "A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used on the jobsite."**
4. **(1926.150(c)(1)(viii)) Portable fire extinguishers shall be inspected periodically and maintained in accordance with NFPA 10.** ESC's extinguishers shall carry a current annual inspection tag and shall be visually inspected **monthly** with the inspection recorded on the tag.
5. **ESC's on-site extinguisher complement — this is ESC's own standard and it is fixed, not aspirational.** ESC mobilizes, at minimum:

Location	Minimum rating	Quantity
The drill rig — mounted at the operator's access, accessible from the ground	**10B:C**	1
Each ESC pickup / service truck on site	**10B:C**	1 per vehicle
Fuel and flammable-liquid storage point	**20B:C**	1
Field office / gang box / laydown	**2A:10B:C**	1
Spark-producing work (abrasive cutting of rebar or casing), within 50 ft of the work	**10B** or greater	1 at the task

This complement satisfies **1926.150(c)(1)(vi)** (a 10B unit within 50 ft of wherever more than 5 gallons of flammable or combustible liquid, or 5 lb of flammable gas, is in use) and keeps travel distance from any point of ESC's work area to the nearest extinguisher **under the 100 ft required by 1926.150(c)(1)(i).** Because ESC's work area is a parking lot rather than an enclosed building, the 100-ft travel-distance rule, not the 3,000-sq-ft floor-area rule, is the controlling test — and ESC applies it by walking the distance, not by estimating it. Extinguishers are **visually inspected monthly by the Competent Person and the inspection is initialled on the tag**, and are

serviced and certified annually by a licensed vendor — ESC's servicing vendor is **Boston Fire Extinguisher Co., Inc., 168 Commercial Street, Lynn, MA 01905, (781) 592-1670.** The vendor's tag, not this manual, is the record of the 6-year internal maintenance and 12-year hydrostatic-test intervals required by NFPA 10.

Extinguishers on site — verified before the first shift: total units _____ **annual service tag current on all units: Yes □ No — DO NOT MOBILIZE □ Verified by** _____ **Date** _____

1. **Access to firefighting equipment shall be maintained at all times (1926.150(a)(4)). ESC equipment, material, hose or cord shall never block a fire hydrant, a fire department connection, a standpipe, an extinguisher, or a designated fire-apparatus access route. Access for responding apparatus is never traded for a few feet of laydown.**
2. Per **(1926.151(a)(3))**, **"Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: 'No Smoking or Open Flame.'"**

4.9.2 Flammable and Combustible Liquid Storage — 29 CFR 1926.152

1. **(1926.152(a)(1)) "Only approved containers and portable tanks shall be used for storage and handling of flammable liquids."** Approved metal safety cans, or DOT-approved containers, only. **Plastic gas jugs from a hardware store are prohibited on ESC sites.**
2. **(1926.152(a)(2)) "Flammable liquids shall be kept in closed containers when not actually in use."**
3. **(1926.152(b)(1)) "No more than 25 gallons of flammable liquids shall be stored in a room outside of an approved storage cabinet."**
4. **(1926.152(b)(2))** Quantities of flammable liquid in excess of 25 gallons shall be stored in an **acceptable or approved cabinet** meeting the design, construction and capacity requirements of 1926.152(b)(3), which shall be **labeled in conspicuous lettering: "Flammable — Keep Fire Away."** Not more than **60 gallons of flammable (Category 1, 2, 3) or 120 gallons of Category 4 liquids** shall be stored in any one storage cabinet.
5. **(1926.152(c)(4)) Storage of containers outside of buildings shall not exceed the quantities and shall observe the separation distances in Table F-2**, and **(c)(3))** portable tanks shall be provided with emergency venting and pressure/vacuum vents.
6. **(1926.152(g)(9)) "Nozzles of the automatic-closing type without a latch-open device shall be used." (g)(11)) "The dispensing hose shall be an approved type."**
7. **(1926.152(g)(8)) "Clearly identified and easily accessible switch(es) and/or circuit breaker(s) shall be provided at a location remote from dispensing devices... to shut off the power to all dispensing devices in the event of an emergency."**
8. **Diesel fuel is a combustible liquid, not a flammable liquid, but it burns, it is a serious skin and inhalation hazard, and it is a reportable spill.** ESC's fuel-storage standard on every site:
   - Diesel is stored **only** in a **UL-listed / DOT-approved double-walled tank, or in an approved metal safety can** — never in an unlisted single-wall tank and never in a hardware-store plastic jug (1926.152(a)(1)).
   - **Secondary containment shall be rated at not less than 110% of the capacity of the largest container within it.** A double-walled tank provides its own containment; a single-wall container does not and must sit in a containment berm or pan.
   - **A spill kit — absorbent boom, absorbent pads, granular absorbent, a shovel and a sealable disposal drum or bag — is stationed at the fuel point and at the rig, and drip pans are placed under the machine during every fuelling and every hydraulic hose change.** A blown hydraulic hose on a drill rig is a credible reportable-quantity release (see §4.9.3(6)).
   - **The tank actually on site is recorded below before the first drop of fuel is dispensed.** The capacity and containment volume are read off the tank's own data plate — not from memory, and not from another job.

Fuel storage on site — recorded before fuelling begins	Entry
Container type (double-walled tank / approved metal safety cans)	_____
Listing or approval marking read off the data plate (UL / DOT)	_____
Capacity (gallons), from the data plate	_____
Secondary containment — integral double wall, or berm/pan capacity (gallons)	_____
Containment ≥ 110% of largest container	Yes □ No — DO NOT FUEL □
Spill kit present and stocked at the fuel point and at the rig	Yes □ No — DO NOT FUEL □
Verified by (Competent Person)	_____ Date _____

4.9.3 Fueling

1. **Engines shall be SHUT DOWN before fueling** (1926.152(g)(9) and 1926.151(a)). **No exceptions for "just topping off."**
2. **No smoking, no open flame, and no hot work within 50 feet of fueling or of flammable liquid storage.** Posted per 1926.151(a)(3).
3. The fuel nozzle shall be kept **in contact with the fill pipe** during dispensing to prevent static discharge. Containers being filled shall be placed **on the ground**, not on a truck bed or a plastic liner.
4. **A fire extinguisher rated not less than 10B shall be within 50 feet of the fueling point** (1926.150(c)(1)(vi)).
5. **Fueling shall not be performed over a storm drain, a catch basin, or an open excavation.** A **spill kit (absorbent boom, pads, and a sealed disposal bag) shall be at the fueling point.** Spills shall be contained immediately.
6. **Spill reporting — the Massachusetts numbers, stated plainly, because a crew guessing at them in the moment is how a 2-hour clock gets missed.**

Notification of a release, or threat of release, of oil or hazardous material is required in Massachusetts under the **Massachusetts Contingency Plan (MCP), 310 CMR 40.0300.** The two things the crew must know:

Trigger	What ESC does	Clock
A sudden release of 10 gallons or more of oil — and diesel, hydraulic oil and lubricating oil are all "oil" — within any period of 24 consecutive hours	This is at or above the **Reportable Quantity** and is a **Two-Hour Reportable Condition** under **310 CMR 40.0311. Notify MassDEP.**	**Within 2 hours** of obtaining knowledge of the release
A release of ANY size that reaches — or is about to reach — a wetland, surface water, a storm drain, or a drinking-water resource area	Treated by ESC as **presumed reportable.** Notify MassDEP. **Do not measure first; report first.**	**Within 2 hours**
A release below the Reportable Quantity, contained on pavement, reaching nothing	**Still fully cleaned up and documented.** No MassDEP notification required.	Immediately

THE ORDER OF CALLS — do not reverse it. Per MassDEP's own guidance, the **local fire department is called first**, then MassDEP. So:

(1) STOP work and contain — deploy the spill kit, dam the storm drain, stop the source if it is safe to do so.
(2) Notify the ESC Competent Person, Jean Prinsloo, and the local fire department — 911 for any release involving fire, fume or immediate danger; the department's non-emergency line, as written on the site emergency card, otherwise.
(3) Notify the general contractor.
(4) Notify MassDEP 24-Hour Emergency Response Line — 1-888-304-1133 — within 2 hours.
(5) For a release reaching navigable waters, notify the National Response Center — 1-800-424-8802.
(6) Document: what, how much, when, where it went, what was done.

WHEN IN DOUBT, REPORT. There is no penalty for reporting a release that turns out to be below the Reportable Quantity. There is a substantial one for missing a two-hour clock on a release that was above it.

ESC works to the project's spill prevention and stormwater controls as well as its own. ESC obtains the general contractor's spill prevention / SWPPP requirements for the site at the pre-construction meeting, complies with them where they are stricter than this section, and records the reference below. **Where the GC has no such plan, this section is the plan and ESC follows it.**

Spill prevention — confirmed at the pre-construction meeting	Entry
GC spill prevention plan / SWPPP reference (title, date)	_____
Stricter requirement imposed by the GC or the owner, if any	_____
Storm drains and any stormwater basin within the work zone — located and protected (inlet socks / mats)	Yes □ Date _____
Spill kit locations on site	_____
Reviewed with crew by	_____ Date _____

4.9.4 Hot Work

1. **ESC performs NO welding and NO torch cutting in its drilled-pier scope.** Nothing in that scope — drilling, casing, cage setting, tremie placement, concrete — requires it. **The only spark-producing operation inside ESC's scope is abrasive cutting and grinding of reinforcing steel and casing** (chop saw, cut-off wheel, grinder). That operation is performed **under a hot work permit issued by the general contractor wherever the GC's program requires one**, and always under the controls below. Where cutting, welding or grinding that produces sparks is performed:

2. A **hot work permit** shall be obtained from the general contractor.
3. **(1926.352(a))** When practicable, objects to be welded/cut shall be moved to a designated safe location; **(b))** where the object cannot be moved, **all movable fire hazards in the vicinity shall be taken to a safe place**; **(c))** if the object cannot be moved and the fire hazards cannot be removed, **guards shall be used to confine the heat, sparks and slag.**
4. **(1926.352(d)) "Suitable fire extinguishing equipment shall be immediately available in the work area and shall be maintained in a state of readiness for instant use."**
5. **(1926.352(e)) "When the welding, cutting, or heating operation is such that normal fire prevention precautions are not sufficient, additional personnel shall be assigned to guard against fire while the actual welding, cutting, or heating operation is being performed, and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists. Such personnel shall be instructed as to the specific anticipated fire hazards and how the firefighting equipment provided is to be used." ESC's fire watch shall be maintained for a minimum of 30 minutes after completion, and 60 minutes where the GC's permit requires it.**
6. **Compressed gas cylinders** shall be secured upright, valve caps in place when not in use, oxygen separated from fuel gas by 20 feet or a 5-foot noncombustible barrier of at least ½-hour fire resistance (1926.350(a)(10)), and shall never be lifted by the valve cap or the regulator.

4.10 General Site Rules and Personal Protective Equipment

4.10.1 Minimum PPE — 29 CFR 1926 Subpart E

1. **Hard hat** (ANSI Z89.1) — at all times on site (1926.100(a)). ESC standard is a **Type II** helmet with a chin strap for work near equipment and at height.
2. **Eye protection** (ANSI Z87.1) — at all times on site (1926.102). **Face shield in addition to safety glasses** for grinding, chipping, cutting, and any concrete or slurry splash exposure.
3. **High-visibility apparel** — ANSI/ISEA 107 **Class 2** minimum at all times; **Class 3** for flaggers, spotters, night work and work adjacent to live vehicle routes (23 CFR 634). See §4.8.4.
4. **Foot protection** (ANSI Z41 / ASTM F2413) — **safety-toe, puncture-resistant** boots at all times (1926.96). **Waterproof boots for all concrete, slurry and wet-drilling work.**
5. **Hand protection** — cut-resistant gloves for rigging, rebar and tool work; **alkali-resistant nitrile or rubber gloves for all wet concrete, grout and slurry contact.** See §4.3.4.
6. **Hearing protection** — required where noise exposure equals or exceeds the levels in **29 CFR 1926.52 Table D-2** (an 8-hour TWA of 90 dBA), and provided and required by ESC at the **85 dBA action level** as a matter of policy. **Drill rigs, hydraulic hammers, chipping hammers, saws and concrete pumps all exceed 85 dBA.** Dual protection (plugs plus muffs) shall be worn for hoe-ramming and chipping.
7. **Respiratory protection** — see the Written Silica Exposure Control Plan (**Part 2, Sections 2.3 and 2.4**). **Where a respirator is required, 29 CFR 1910.134 applies in full: written program, medical evaluation BEFORE fit testing or use, annual fit test, clean-shaven sealing surface, training, cleaning and storage.** These cannot be arranged on the morning they are needed. ESC pre-qualifies crew on half-mask P100s so that an overrun on a chipping or sawing task does not become a violation.

The sequence is fixed and cannot be reordered: MEDICAL EVALUATION → FIT TEST → USE. Per **1910.134(e)(1)** the medical evaluation is performed **before the employee is fit tested or required to use the respirator.** Per **1910.134(f)(2)** the fit test is performed **before initial use, whenever a different facepiece (size, style, model or make) is used, and at least annually thereafter.**

ESC's providers — named, because a program that cannot name its PLHCP does not have one:

- **PLHCP and quantitative fit testing (QNFT): OccuMed Occupational HealthWorks, 5 Dan Road, Canton, MA 02021 — office (877) 399-1698, clinic (781) 664-2842, info@occumedne.com.** OccuMed also provides the spirometry, audiograms and chest X-ray required for silica medical surveillance under 1926.1153(h). *(ESC confirms with OccuMed at booking that the silica chest X-ray is interpreted and classified by a **NIOSH-certified B Reader**, as 1926.1153(h)(2) requires.)*
- **Alternate PLHCP route for the medical evaluation questionnaire (1910.134 Appendix C): the 3M Online Respirator Medical Evaluation** (3M Center for Respiratory Protection), a web questionnaire reviewed by a PLHCP with the clearance letter returned in writing. OSHA does not require an in-person examination unless the PLHCP calls for one.

Fit-test and clearance dates are per-employee records, not a fact about the company. They are recorded in the Respiratory Protection roster below and in the training matrix (§4.10.4), and the PLHCP's written clearance is retained in each employee's file. **No employee wears a tight-fitting respirator on an ESC site without a current medical clearance and a current fit test on the exact facepiece he is wearing.** Facial hair on the sealing surface voids the fit test on the spot.

Respiratory protection roster — one line per employee	Entry
Employee name (print)	_____
PLHCP medical clearance — provider and date	_____
Facepiece make / model / size fit tested	_____
Fit test type (QNFT / QLFT), provider, date	_____
Fit test expires (1 year from test date)	_____
Clean-shaven at the sealing surface — confirmed at the daily briefing	Yes □ No — NO RESPIRATOR USE □
Verified by (Competent Person)	_____ Date _____

1. **Fall protection** — see **Part 3, §3.9 (Open Shaft Protection)**.
2. **PPE is provided by ESC at no cost to the employee**, per 29 CFR 1926.95(d), with the exception of ordinary safety-toe footwear and ordinary prescription safety eyewear as permitted by that provision.

4.10.2 Sanitation — 29 CFR 1926.51

ESC will ensure that **potable drinking water (1926.51(a))**, **toilet facilities (1926.51(c))**, and **washing facilities (1926.51(f))** are available on site. **Washing facilities with clean water and skin cleanser are mandatory wherever wet concrete, grout or slurry is handled** (see §4.3.4). Where facilities are provided by the general contractor, ESC will confirm their availability and adequacy in the pre-construction meeting and will document that confirmation.

4.10.3 Stop-Work Authority

Every ESC employee — and every employee of every other trade on site — has the unconditional authority and the affirmative obligation to stop any ESC operation that appears unsafe, without fear of reprisal of any kind. Per **ANSI/ASSP A10.23 §12.15**, the emergency stop signal **may be given by any worker** and shall be obeyed by the operator. This is stated at every toolbox talk and at every pre-task briefing. **No ESC supervisor may overrule a stop-work call; the call is resolved by making the condition safe, not by argument.**

4.10.4 Inspections, Training and Records

1. **(29 CFR 1926.20(b)(2))** ESC shall provide for **frequent and regular inspections of the job sites, materials and equipment, to be made by competent persons designated by the employer.** Designated Competent Person: **Jean Prinsloo, MA CS-122896.**
2. **(29 CFR 1926.21(b)(2))** ESC **shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.**
3. **(29 CFR 1926.20(b)(4))** ESC shall **permit only those employees qualified by training or experience to operate equipment and machinery.**
4. **Daily documentation.** The following shall be completed, signed and retained for every shift: Daily Rig / Lifting Equipment Inspection; Daily Excavation Inspection (where applicable); Competent Person silica control check; Pre-Task Briefing / JHA review with crew sign-in; Traffic control and work-zone integrity check. Forms are at the Appendices listed in Part 5, Section 5.11 and in the Appendix Index at the end of this manual.
5. **Training records.** ESC shall maintain signed rosters for all training required by this Part, recording the date, the topic, the trainer and the attendees. **Training dates and card numbers are per-employee records held in the training matrix and evidenced by the employee's own card — ESC does not publish them in this program, and ESC does not claim a credential before it is earned.** The cards are produced to the general contractor with the mobilization submittal, and the card in the employee's pocket is the record.

The one statutory requirement that governs every hand on this job — M.G.L. c. 30, §39S. Any person contracting to work on the construction or repair of a public building of a city or town **estimated to cost more than $10,000** must certify that **all employees to be employed at the worksite will have successfully completed an OSHA-approved construction safety and health course of at least 10 hours at the time the employee begins work**, and must furnish documentation of completion **with the first certified payroll report for each employee. Any employee found on such a worksite without that documentation is subject to immediate removal** (§39S(b)). A large share of ESC's work is municipal and public-agency work that exceeds that threshold. **Every ESC employee on such a site holds a current OSHA 10 card (or higher) before he sets foot on it — there is no room in a company of ten or fewer for one untrained hand — and the documentation goes on the first certified payroll.** Training is completed **before mobilization**, not during the first week on site, because the DOL plastic card takes weeks to arrive and the course-completion certificate is the interim proof.

ESC's training providers — named:

Training	Provider
OSHA 10-hour and 30-hour Construction (OSHA 30 for the Site Superintendent / Competent Person; OSHA 10 minimum for every field employee)	**Keene State College OSHA Education Center** — the Region 1 (New England) OSHA Training Institute Education Center — 1050 Perimeter Road, Suite 202, Manchester, NH 03103; **1-800-449-6742**; oshaed@keene.edu

Training	Provider
First Aid / CPR / AED (2-year certification)	**American Red Cross — Massachusetts** (redcross.org/local/massachusetts), or **Health and Safety Services of Massachusetts, (781) 941-0895**, for on-site group classes
Respirator medical evaluation and fit testing; silica medical surveillance	**OccuMed Occupational HealthWorks, Canton, MA — (877) 399-1698** (see §4.10.1(7))
Rigging, signal person, operator qualification, competent-person duties, and all site-specific training required by this Part	Delivered by ESC and documented on the signed roster; the basis of each designation is recorded on the written designation forms in §4.1.8

Training matrix — one line per employee per topic	Entry
Employee name (print)	_____
Topic	_____
Provider / trainer	_____
Date completed	_____
Card or certificate no., where the provider issues one (transcribed from the card — never from memory)	_____
Expiry / next refresher due	_____
Documentation furnished with first certified payroll (M.G.L. c.30 §39S)	Yes □ Date _____

1. **Recordkeeping note.** ESC had **10 or fewer employees at all times during 2023, 2024 and 2025**, and is therefore **partially exempt from routine OSHA injury and illness recordkeeping under 29 CFR 1904.1. That exemption reaches only the OSHA 300 log. It does not exempt ESC from any requirement of this Part, from 29 CFR 1926.1153 (silica), or from 29 CFR 1904.39, which requires ESC to report a work-related fatality to OSHA within 8 hours and any work-related in-patient hospitalization, amputation or loss of an eye within 24 hours.**

Part 4 approved and issued by:

Derek Snow, Treasurer — Earth Support Corp. — 56 Broad Street, Suite 32686, Boston, MA 02109
support@earthsupportcorp.com

Signature: _____ **Date:** _____

Competent Person acknowledgment:

Jean Prinsloo — MA Construction Supervisor License CS-122896
support@earthsupportcorp.com

Signature: _____ **Date:** _____

Effective date of this Part: July 14, 2026 (Revision 1.0). Next scheduled review: July 14, 2027.

PART 5 — EMERGENCY RESPONSE, INCIDENT MANAGEMENT & PROGRAM ASSURANCE

Part 5 covers what ESC does when something goes wrong, how ESC finds out why, and how ESC proves — to itself, to a General Contractor, and to a federal OSHA Compliance Safety and Health Officer (CSHO) — that this Safety & Health Program is actually being run and not merely printed.

Federal OSHA (29 CFR Part 1926) applies to ESC's private-sector construction work in Massachusetts; Massachusetts operates no State Plan covering private-sector construction. ESC self-performs deep foundations and earth retention (drilled-pier caissons, soil-nail walls, shoring / support of excavation, underpinning, slope stabilization) in MA, RI and CT, and also works in NH, VT and ME.

5.1 Emergency Action Plan (29 CFR 1926.35)

5.1.1 Purpose and applicability

ESC maintains a written Emergency Action Plan ("EAP") per 29 CFR 1926.35. The EAP describes the actions ESC employees must take to ensure their safety from fire and other emergencies.

Note on the small-employer allowance: 29 CFR 1926.35(e)(3) provides that "the employer may orally communicate the plan to employees" where the employer has 10 or fewer employees, and a written plan need not be maintained. ESC has had 10 or fewer employees at all times during 2023, 2024 and 2025 and is therefore permitted to communicate the EAP orally. **ESC nevertheless maintains this EAP in writing, reviews it with every crew, and keeps a copy in the site box and in each ESC vehicle.** A written plan is what a General Contractor and an OSHA CSHO will ask for, and an oral plan cannot be handed to a first responder.

5.1.2 Required elements — 29 CFR 1926.35(b)

The EAP contains, at minimum, the six elements required by 1926.35(b):

#	1926.35(b) element	ESC implementation
1	(b)(1) Emergency escape procedures and emergency escape route assignments	Section 5.1.4 and the Site-Specific Emergency Information Sheet (Appendix 5-A)
2	(b)(2) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate	Section 5.1.5
3	(b)(3) Procedures to account for all employees after emergency evacuation has been completed	Section 5.1.6
4	(b)(4) Rescue and medical duties for those employees who are to perform them	Sections 5.1.7 and 5.3
5	(b)(5) The preferred means of reporting fires and other emergencies	Section 5.1.3
6	(b)(6) Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan	Section 5.1.9

5.1.3 Reporting an emergency — the preferred means (1926.35(b)(5))

1. **Any employee may declare an emergency and stop work. No employee will be disciplined for stopping work or calling 911.**
2. Life-threatening emergency (injury, fire, electrical contact, collapse, person in a shaft): **CALL 911 FIRST.** Do not call the office first. Do not call the General Contractor first.
3. Immediately after 911, notify, in this order:
   - ESC Site Safety Supervisor / Competent Person — **Jean Prinsloo**
   - ESC Treasurer — **Derek Snow**
   - **The General Contractor. The name and cell number of the GC superintendent physically running the site are obtained at the pre-mobilization meeting, written onto the Site-Specific Emergency Information Sheet (Appendix 5-A) before the first day of work, and briefed at the first daily huddle.** ESC does not mobilize without that number.

(All three direct numbers are written on the Site-Specific Emergency Information Sheet and posted at the site box and in every ESC vehicle. This program does not print them, because the sheet is the copy that is current.)

1. Non-life-threatening emergency or hazardous condition (equipment failure, unstable ground, utility exposed, small spill): stop work, secure the area, notify the Competent Person immediately.
2. Site alarm: ESC jobsites are small, open-air work areas. The preferred alarm is a **verbal alarm plus three (3) long blasts on an air horn**, which is carried on the rig and at the tool trailer. Where the crew is spread out, two-way radios are the backup; **the site radio channel is assigned at the pre-mobilization meeting, recorded on the Site-Specific Emergency Information Sheet, and restated at every daily huddle** — a radio on the wrong channel is not a control. Any employee alarm system used will meet 29 CFR 1926.159 (perceivable above ambient noise, distinctive, maintained, tested).

5.1.4 Evacuation and escape routes (1926.35(b)(1))

1. On mobilization, the Competent Person will identify and brief the crew on: the primary and secondary **egress routes off the work area**, the **crew assembly point**, and the **emergency access route** into the work area. These are recorded on the Site-Specific Emergency Information Sheet (Appendix 5-A) and marked on the site plan.

2. Egress routes must be kept clear of spoil, casing, cages, hose and tooling at all times.
3. The **emergency access route must be kept open**. On projects in active parking lots, on live campuses, or at occupied institutional and public-safety facilities, ESC will confirm the fire and ambulance access route with the GC and the facility **in writing before mobilizing**, and will not block it with the rig, spoil, trucks or barricades.
4. On the alarm, employees will: secure their tool (see 5.1.5), walk — not run — by the assigned route, and proceed to the crew assembly point.
5. Employees must not re-enter the work area until the Competent Person or the incident commander (fire department) authorizes it.

5.1.5 Critical operations shutdown before evacuation (1926.35(b)(2))

Only the following shutdown steps are performed before evacuating, and **only if they can be done in seconds and without exposing the employee**:

1. **Drill rig operator** — set the tooling down / land the kelly, set the brakes, kill the engine, remove the key, exit and evacuate. **EXCEPTION — ELECTRICAL CONTACT: if the rig, mast, winch line or load has contacted or may have contacted an energized overhead conductor, the operator STAYS IN THE CAB.** Do not shut down and step off. Warn everyone away, and remain in the cab until the utility confirms the line is de-energized and grounded, unless there is imminent danger of fire or explosion — in which case JUMP CLEAR (never touching the machine and the ground at the same time), land with both feet together, and shuffle or hop away with feet together to clear the ground-potential gradient. No one else may touch the rig, the load, the tooling or the ground near it.
2. **Concrete / grout pump** — hit the emergency stop, relieve line pressure if it is safe to do so, evacuate.
3. **Fuel and compressed gas** — close the valve at the source if it is within arm's reach and not involved in the fire.
4. **Open shafts** — if a shaft is open, secure or cover it if that can be done immediately; otherwise verbally warn all personnel and the fire department of its location on arrival. (Cover and barricade requirements are in the open-hole section of this manual.)
5. **Nothing else is worth a life.** Materials, tooling and equipment are abandoned.

5.1.6 Accounting for employees (1926.35(b)(3))

1. The **crew assembly point** — the place the crew walks to on an alarm and is counted at — is identified on the Site-Specific Emergency Information Sheet and is briefed daily. The alternate assembly point is used if the primary is upwind of, or downwind of, the hazard, or is otherwise unusable.
2. The Competent Person (or, in his absence, the designated alternate) takes a **head count against the daily sign-in sheet** immediately at the assembly point.
3. The head count is reported to the GC's superintendent and to the fire department incident commander.
4. **If any employee is unaccounted for, that is reported to the incident commander immediately.** ESC employees do not conduct search or re-entry themselves.
5. ESC also accounts for its subcontracted delivery drivers, pump operators and testing/inspection personnel who signed in on the ESC sheet that day.

5.1.7 Rescue and medical duties (1926.35(b)(4))

ESC does not perform technical rescue. ESC performs first aid, calls 911, secures the scene, and assists the professional responders. This is a deliberate policy decision, not a gap.

1. **First aid / CPR / AED** — performed by ESC's trained first-aid provider(s) on site (Section 5.3).
2. **Fall into an open shaft** — **NO ESC EMPLOYEE WILL ENTER A DRILLED SHAFT UNDER ANY CIRCUMSTANCE, INCLUDING TO ATTEMPT A RESCUE.** ESC's shafts are typically 30–36 in. in diameter; the atmosphere is untested and can be oxygen-deficient or contain accumulated heavy gases; the walls can ravel; and no ESC employee can be extracted by an untrained would-be rescuer. Would-be rescuers are the most common second fatality in confined-space events. The procedure is: **call 911 and request technical rescue; do not enter; do not lower anyone; keep the person talking if possible; lower nothing that could fall on them; keep all equipment away from the collar; ventilate only if directed to do so by the responding fire department; and hand the responders the site plan showing the shaft depth, diameter, casing depth and groundwater elevation.** ESC's absolute no-man-entry policy is the reason this scenario is designed out rather than managed.
3. **Trench / excavation collapse** — same rule: **no ESC employee enters a collapsed or collapsing excavation.** Call 911 and request trench rescue. Secure the spoil pile and equipment away from the edge, prevent secondary collapse, and account for the crew.
4. **Electrical contact** — see 5.1.5(1). No one approaches the equipment. Call 911 and the utility.
5. **Rescue equipment** available at the site: **ANSI/ISEA Z308.1 Class B first aid kit; AED; portable eyewash; fire extinguishers (drill rig, each vehicle, fuel point); air horn; spare barricades and covers.** ESC does **not** carry, and does not use, shaft or trench entry/retrieval equipment — ESC does not enter shafts or collapsed excavations. ESC will maintain a means of prompt communication with emergency services at all times (29 CFR 1926.50(e)).

5.1.8 Emergency-specific response summary

Emergency	Immediate action
Serious injury / unresponsive person	Call 911. Trained first-aid provider renders care. Do not move the person unless there is a further immediate threat. Send a runner to the site entrance to meet the ambulance.
Person falls into an open shaft	**Do not enter.** Call 911, request technical rescue. Section 5.1.7(2).
Excavation / shaft collapse with person in or near it	**Do not enter.** Call 911, request trench rescue. Section 5.1.7(3).
Contact with overhead power line	Operator **stays in the cab**. Everyone else stays clear of the machine, the load and the ground around it. Call 911 and the utility. Section 5.1.5(1).
Underground utility strike — gas	Evacuate upwind immediately. No ignition sources — no engines started or stopped, no phones or radios used in the vapor area, no switches. Call 911 from a safe distance, then the gas utility. Do not attempt to stop the leak.
Underground utility strike — electric	Stop work, keep everyone back, treat conductors and equipment as energized, call 911 and the utility.
Underground utility strike — water / sewer / fiber / communications	Stop work, secure the area, notify the GC and the utility owner.
Fire	Alarm, evacuate, call 911. Extinguisher use is voluntary and only on an incipient fire, with a clear escape path at your back (Section 5.2).
Rig overturn / equipment upset	Evacuate the swing radius, do not approach, shut down remotely if possible, call 911 if anyone is injured or trapped.
Severe weather / lightning	Cease all crane, rig, mast and hoisting work. **30-30 rule:** if the time between lightning and thunder is 30 seconds or less, take shelter in a hard-topped vehicle or substantial building; resume no sooner than 30 minutes after the last thunder or lightning. Lower the mast if time allows and it can be done safely.
Heat / cold emergency	Move to shade or warm shelter, cool or warm the person, call 911 for any altered mental status (suspected heat stroke is a 911 call, always).
Suspicious package, threat, or active-shooter event (public buildings, police / fire stations, schools)	Follow the facility's own protocol and the direction of the facility's personnel; ESC crews evacuate to the alternate crew assembly point and account for personnel. Coordinated in advance with the facility per Section 5.1.10.

5.1.9 Contacts for further information (1926.35(b)(6))

Role	Name	Contact
Plan owner / signatory	Derek Snow, Treasurer	support@earthsupportcorp.com · direct number on the site-specific sheet
Site Safety Supervisor / Competent Person	Jean Prinsloo (MA Construction Supervisor License CS-122896)	support@earthsupportcorp.com · direct number on the site-specific sheet
Alternate Competent Person (in Jean Prinsloo's absence)	Derek Snow, Treasurer	support@earthsupportcorp.com · direct number on the site-specific sheet
Designated first-aid / CPR / AED provider on shift	Named on the Daily Pre-Task Plan / Huddle Sheet (Appendix 5-B) every shift, before work starts	Provider on shift: _____ Cell: _____

ESC is a two-officer company: Derek Snow (Treasurer) and Jean Prinsloo (Site Superintendent and designated Competent Person, MA CS-122896). There is no separate safety department and no third officer to call. Derek Snow is the alternate Competent Person and the person to whom every stop-work escalation goes.

Any employee with a question about this plan or about his duties under it will ask the Competent Person or the Treasurer. No question is a nuisance.

5.1.10 Training and review — 29 CFR 1926.35(e)

1. Per 1926.35(e)(1), ESC will designate and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.
2. Per 1926.35(e)(2), ESC will review the plan with each employee: **(a) initially when the plan is developed; (b) whenever the employee's responsibilities or designated actions under the plan change; and (c) whenever the plan is changed.**

3. ESC additionally reviews the site-specific EAP with the whole crew **at the pre-mobilization briefing on every project, and again at the first daily huddle on site**, and re-briefs whenever site conditions, the crew assembly point, the access route or the crew changes.
4. Per 1926.35(e)(4), ESC will review with each employee, upon initial assignment, those parts of the plan the employee must know to protect himself in an emergency.
5. On projects located in or adjacent to an occupied, active or public-safety facility, ESC will coordinate its EAP with the facility's own emergency plan and with the GC **in writing before mobilization**, so that ESC's evacuation, crew assembly and emergency access arrangements do not conflict with the facility's.
6. Training is documented on the Training Roster (Appendix 5-H).

5.1.11 Site-Specific Emergency Information Sheet (template)

This sheet is completed by the Competent Person before the first day of work on every project, posted at the site box / gang box and in each ESC vehicle, reviewed at the first daily huddle, and updated whenever anything on it changes. It must never be posted with blanks.

EARTH SUPPORT CORP. — SITE-SPECIFIC EMERGENCY INFORMATION - **Project:** _____ - **Site address (say this to 911, exactly as written here):** _____ - **Occupied facility on or beside the site, and its own emergency personnel, if any:** _____ — **whatever the answer, still call 911.** 911 dispatches the responders and the ambulance, and creates the record. - **Site entrance / where the ambulance meets us (walk it and write it down — a runner is posted here on any 911 call):** _____ - **GPS coordinates of the work area (read off the phone at the rig and write them down — say them to 911 if asked):** Lat _____ Long _____ - **General Contractor:** _____ - GC superintendent on site: _____ Cell: _____ - **ESC Competent Person / Site Safety Supervisor:** Jean Prinsloo (MA CS-122896) — direct: _____ - **ESC Treasurer:** Derek Snow — direct: _____ **EMERGENCY — CALL 911** | Service | Number | |---|---| | Fire / Police / Ambulance | **911** | | **Nearest police station / on-site first response, where the site serves one** | _____ | | Local police — **non-emergency / business line only** | _____ — **Never dial this in an emergency. Dial 911.** | | Local fire department — **non-emergency / administration only** | _____ — **Never dial this in an emergency. Dial 911.** | | **Nearest Emergency Department** | Hospital: _____ Address: _____ Phone: _____. Open 24 hours? **Yes ☐ No ☐** Trauma center? **Yes ☐ No ☐. A community hospital is the right destination for lacerations, sprains, eye injuries, heat illness and simple fractures — and is NOT the destination for major trauma. Know which one this is before the first shift.** | | **Nearest Level 1 trauma center (crush, degloving, major blunt trauma)** | **Lahey Hospital & Medical Center**, 41 Mall Road, Burlington, MA 01805 — **(781) 744-5100**. ACS-verified Level 1. Approximately 15–17 miles from site. | | **Replantation / limb reattachment (amputation)** | **Massachusetts General Hospital**, 55 Fruit Street, Boston, MA 02114 — **MGH Emergency Department (617) 724-4100**; MGH Hand & Arm Service **(617) 726-4700**. The referral center for acute limb trauma in New England. | | Driving route to the ED | Distance: _____ miles. Actual drive time, driven not estimated: _____. **The turn-by-turn route is printed from a live map before the first day of work and posted in the site box and in each ESC vehicle — it is not left to a phone with no signal.** Route driven, printed and posted by: _____ Date: _____ | | Occupational / non-emergency injury clinic | **OccuMed Occupational HealthWorks**, 5 Dan Road, Canton, MA 02021 — clinic **(781) 664-2842**, office **(877) 399-1698** — Mon–Fri 8:00 AM–5:00 PM. **A co-worker drives; the injured employee never drives himself.** | | Poison Control | **1-800-222-1222** | | **Electric utility — emergency / downed line** | Utility: _____ 24-hr: _____. **Call 911 first for a downed or contacted line, then the utility.** *(In eastern Massachusetts commonly Eversource, 24-hr (800) 592-2000.)* | | **Gas utility — emergency / gas odor** | Utility: _____ 24-hr: _____. **Call 911 first from upwind, then the gas utility. Do not use a phone or radio inside the vapor area.** *(Across much of Massachusetts commonly National Grid, 24-hr (800) 233-5325.)* | | Municipal public works — water, drainage, street opening | Highway / DPW: _____ Engineering: _____ | | Water department / district (24/7 on-call) | _____ | | **MassDEP — 24-hr spill / release line** | **(888) 304-1133**. **Any spill of oil, diesel or hydraulic fluid of 10 gallons or more — or any spill of any size reaching a wetland, surface water, storm drain or drinking-water resource area — is presumed reportable. Call the local fire department first, then MassDEP within 2 hours (310 CMR 40.0311). When in doubt, report.** | | **Dig Safe** (MA/ME/NH/RI/VT premark & locate) — **72 hours' notice, excluding Saturdays, Sundays and legal holidays** (M.G.L. c. 82 §40A; 220 CMR 99.04(1)) | **811** or **1-888-344-7233 / (888) 344-7233** | | Dig Safe ticket for this project — **valid 30 calendar days, and only while the marks stay clear and discernible** (220 CMR 99.07(2)) | Ticket no.: _____ Date called: _____ Expires: _____ | | ESC Workers' Compensation | **In force. The carrier, the identifiers and the carrier's claims telephone number are printed on the ACORD certificate of insurance; a copy of that certificate is kept in the site box and in each ESC vehicle.** Claims are filed by the Treasurer through ESC's insurance broker. | | ESC General Liability, Umbrella / Excess and Contractors Errors and Omissions | **In force. See the certificate of insurance — it is the controlling evidence of coverage.** | | **Federal OSHA — fatality / hospitalization / amputation / eye loss reporting (24 hours)** | **1-800-321-OSHA (1-800-321-6742)** | | OSHA Area Office with jurisdiction | Office: _____ Phone: _____ *(confirmed by the Treasurer for the county the site is in, before mobilization)* | **ON-SITE RESOURCES** - Primary crew assembly point (where the crew walks to on an alarm and is counted): _____ - Alternate crew assembly point (used if the primary is in the smoke, the vapor cloud or the collapse zone): _____ - First aid kit location (ANSI/ISEA Z308.1 **Class B**, weatherproof): _____ - AED location — **ESC's own unit. ESC does not rely on the facility's AED being present or unlocked:** _____ - Host facility's AED location, if the facility identifies one — recorded, but not relied on: _____ - Eyewash location (required within the immediate work area during **all** concrete, grout and cement placement): _____ - Fire extinguishers — locations and the rating read off each unit's own label: _____ - Trained First Aid / CPR / AED provider on shift (**no shift starts without one present**): _____ Certification expires: _____ - Cell coverage at the rig — checked on the first morning, by whom, and result: _____ Adequate to reach 911? **Yes ☐ No ☐** (if No, work does not start until a working means of contacting emergency services is in place) - Site radio channel: _____ - Emergency access route: **The route the ambulance and the fire apparatus use, and — where the site serves an occupied facility — that facility's own emergency egress, MUST remain open at all times: no rig, no spoil pile, no ready-mix truck, no barricade, no parked pickup, ever.** Agreed in writing with the general contractor and the facility owner before mobilization. Describe the agreed route: _____ - **Known site hazards for responders:** open drilled shafts (number, diameter, depth): _____; depth to rock and rock quality: _____; boulders/obstructions logged: _____; groundwater depth and whether casing is expected: _____; buried utility conflicts and the piers being soft-dug: _____; protected exclusion areas: _____; site character (occupied building, public and emergency-vehicle traffic): _____ - **Overhead conductors.** Electric utility owning the line: _____ 24-hr: _____. **Until the utility states the line voltage in writing, ESC works to the OSHA 20-foot default clearance (29 CFR 1926.1408(a)(2), Option 2) — the reduced Table A distance is not available for a line of unknown voltage.** M.G.L. c. 166 §21E additionally requires ESC to notify the utility before any operation within six feet of an overhead high-voltage line (over 440 V), and §21C requires the statutory warning sign posted in the operator's view on the drilling rig. Record what the site walk found: - Overhead line present in or over the work area or the travel path? **Yes ☐ No ☐** Location: _____ - Owner: _____ Voltage, as stated in writing by the utility: _____ Written response received? **Yes ☐ No ☐** - Clearance ESC is working to today: **20 ft** ☐ Table A distance, voltage confirmed in writing: _____ ft ☐ Deenergized and visibly grounded, confirmed by the utility ☐ **Prepared by:** _____ **Date:** _____ **Reviewed with crew — Date:** _____ **Competent Person initials:** _____

5.2 Fire Prevention and Fire Protection

5.2.1 Fire prevention program (29 CFR 1926.24; 1926.150)

Per 29 CFR 1926.24, ESC will be responsible for the development and maintenance of an effective fire protection and prevention program at the job site throughout all phases of the construction work, and will ensure the availability of the fire protection and suppression equipment required by Subpart F. ESC's fire prevention program covers, at minimum, the major workplace fire hazards, the potential ignition sources and their control, the fire protection equipment available to control each major hazard, and the housekeeping needed to control accumulation of flammable and combustible waste.

5.2.2 ESC's fire hazards and their controls

Hazard	Control
Diesel fuel (rig, excavator, pumps, generators, light towers)	Store and dispense per 29 CFR 1926.152. Approved, labeled containers only. No smoking within 50 ft of fueling or fuel storage. **Shut the engine off before fueling.** Bond and ground when transferring flammable liquids. Spill kit at the fueling point.
Hydraulic oil under pressure (rig, hammer, hoe-ram)	Daily hose and fitting inspection; no leaks tolerated near hot surfaces or the exhaust; do not search for a pinhole leak with your hand.
Cutting, welding, torching (rebar cages, casing, templates)	29 CFR 1926.352: fire watch during and **at least 30 minutes after** the work; combustibles removed 35 ft or shielded; suitable extinguisher immediately available; hot-work permit where required by the GC or facility.
Oxygen/acetylene	29 CFR 1926.350: cylinders upright, secured, valve caps on when not in use, separated per the standard, hoses and regulators inspected.
Combustible waste — form lumber, packaging, rags, spoil tarps	Daily housekeeping; oily rags in a covered metal container; no accumulation at the site box or under the rig.
Temporary electrical / generators	29 CFR 1926.404 and 1926.405; GFCI protection; no damaged cords; no overloading.
Battery charging, lithium tool batteries	Charge in a designated area away from combustibles; damaged or swollen packs are removed from service and disposed of properly.

5.2.3 Fire extinguishers (29 CFR 1926.150(c))

1. Per 1926.150(c)(1)(i), ESC will provide **a fire extinguisher rated not less than 2A for each 3,000 sq. ft. of the protected building area, or major fraction thereof; travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.**
2. Per 1926.150(c)(1)(iv), a fire extinguisher rated **not less than 10B** will be provided **within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used** on the jobsite.

3. ESC will carry, at minimum, an **ABC dry-chemical extinguisher rated not less than 10-lb / 4A:60B:C on the drill rig, in each ESC vehicle, and at the fuel and hot-work locations. Read the rating printed on each unit's own label — do not assume it — and record it on the Weekly Site Safety Inspection (Appendix 5-D) and on the Site-Specific Emergency Information Sheet.** A unit whose label rating is below the minimum above is replaced, not "noted."

Location	Unit rating read from the label	Last service tag date	Inspected by / date
The drill rig			
Fuel / service point			
Hot-work location			
ESC vehicle			

1. Extinguishers are **visually inspected monthly by ESC** (a checklist item — no vendor needed) and **maintained and certified annually by a licensed extinguisher service vendor**, with the tag signed and dated. ESC's servicing vendor is **Boston Fire Extinguisher Co., Inc., 168 Commercial Street, Lynn, MA 01905 — (781) 592-1670**, which sells, services, recharges and hydrostatically tests portable extinguishers. **The internal-maintenance and hydrostatic-test intervals for each unit are those stated on that unit's service tag by the licensed vendor** — ESC does not second-guess the tag, and does not put a unit back in service without one. An extinguisher that has been discharged, even partially, is taken out of service immediately and replaced.
2. Extinguishers are kept clear, visible, and accessible — never buried behind casing, hose or spoil.

5.2.4 Employee use of extinguishers

ESC does not require any employee to fight a fire. Extinguisher use by ESC employees is **voluntary and limited to a small incipient fire**, and only when: the alarm has been raised and 911 has been called; the fire is smaller than the extinguisher is rated for; the employee has an unobstructed escape path at his back; and the employee has been trained. **If there is any doubt, evacuate.** Employees who may use an extinguisher are trained on its use upon initial assignment and at least annually.

5.3 First Aid and Medical Services (29 CFR 1926.50)

5.3.1 Medical services

1. Per 29 CFR 1926.50(a), ESC will ensure the availability of medical personnel for advice and consultation on matters of occupational health. **ESC's occupational health provider is OccuMed Occupational HealthWorks (OccuMed of New England), 5 Dan Road, Canton, MA 02021 — clinic (781) 664-2842, office (877) 399-1698, info@occumedne.com, Mon–Fri 8:00 AM–5:00 PM.** OccuMed provides ESC's chest X-rays, spirometry, audiograms and quantitative respirator fit testing. **Where the respirator medical evaluation under 29 CFR 1910.134(e) is done by the Appendix C questionnaire route rather than an in-person exam, ESC uses the 3M Online Respirator Medical Evaluation service (3M Center for Respiratory Protection), whose reviewing PLHCP returns the written clearance.** OSHA does not require an in-person exam unless the PLHCP calls for one.
2. Per 1926.50(b), provisions will be made **prior to the start of every project** for prompt medical attention in case of serious injury. This is done by completing the Site-Specific Emergency Information Sheet (Appendix 5-A), including the identified emergency department, the route to it, and the confirmed emergency-vehicle access into the work area.
3. **ESC plans to three tiers of care, not one, because a caisson rig produces crush and amputation injuries that a community emergency room is not the right destination for.** EMS makes the destination decision — but the crew and the Competent Person know the answer before it happens, and **say the words "crush injury," "amputation" or "major trauma" to the 911 dispatcher** so that the right facility and the right transport mode are chosen from the first minute.

Tier	Injury	Facility
Emergency department	Lacerations, sprains, eye injuries, heat illness, simple fractures, cement burns	**Emerson Hospital**, 133 Old Road to Nine Acre Corner, Concord, MA 01742 — **(978) 369-1400**; 24-hour ED. Approximately 7 miles / about 15 minutes. **A community hospital, not a trauma center.**
Level 1 trauma	Crush, degloving, major blunt trauma, equipment upset with a person under it	**Lahey Hospital & Medical Center**, 41 Mall Road, Burlington, MA 01805 — **(781) 744-5100**. Verified by the American College of Surgeons as a **Level 1 Trauma Center**; the nearest Level 1 to the site. Approximately 15–17 miles.
Replantation / limb reattachment	Amputation of a hand, finger, arm or foot	**Massachusetts General Hospital**, 55 Fruit Street, Boston, MA 02114 — **MGH Emergency Department (617) 724-4100**; MGH **Hand & Arm Service (617) 726-4700**. MGH is the referral center for acute limb trauma in New England. **For an acute amputation the patient goes to the MGH Emergency Department, not to an outpatient suite.**

1. **Amputation — the crew's four jobs.** Call 911 and say the word **"amputation."** Control the bleeding (direct pressure; tourniquet from the Class B kit if bleeding is not controlled by pressure). Care for the patient. **Preserve the amputated part correctly and send it with the patient:** wrap it in sterile gauze **moistened** with saline, seal it in a clean plastic bag, and place that bag **on ice or in ice water — never place the part directly on ice, and never immerse it in water.** This procedure is reviewed with the crew by ESC's First Aid/CPR trainer at certification and is a standing toolbox-talk topic (Section 5.8.3).
2. **An amputation is reportable to OSHA within 24 hours even if the employee is treated and released. See Section 5.5 — that clock starts the moment ESC learns of it.**

5.3.2 Trained first-aid provider on site (29 CFR 1926.50(c))

1. Per 1926.50(c), "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 training** from the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, **shall be available at the worksite to render first aid.**"
2. OSHA has interpreted "reasonably accessible" to mean that emergency medical care must be available **within roughly 3–4 minutes** where the work involves an immediately life-threatening hazard (such as electrical, struck-by, crushing, engulfment or fall hazards), and within roughly 15 minutes otherwise. **ESC's work always involves such hazards.**
3. **ESC therefore adopts the following as a standing rule, regardless of the distance to a hospital: at least one ESC employee holding current First Aid, CPR and AED certification will be physically present on every ESC jobsite during every shift in which work is performed.** ESC crews are small, so this is a hard staffing constraint — a shift does not start without a certified provider present.
4. Certifications are from the **American Red Cross** (Massachusetts — redcross.org/local/massachusetts/take-a-class), the **American Heart Association**, or an equivalent program, and are **valid for two years**. ESC books on-site group classes so that **at least two crew members per shift are certified** and coverage survives one person being absent; **Health and Safety Services of Massachusetts, (781) 941-0895**, is a Massachusetts-based provider that delivers this training on site. Certification currency is recorded on the Training Roster (Appendix 5-H) and carried forward onto this table, which is completed and signed by the Competent Person — **it is filled in from the cards themselves, never from memory:**

Employee (print)	Certification	Training provider	Date issued	Date expires
Jean Prinsloo	First Aid / CPR / AED			
	First Aid / CPR / AED			
	First Aid / CPR / AED			

Completed by (Competent Person): _____ **Date:** _____

1. **The certified provider on shift is named, by name, on the Daily Pre-Task Plan / Huddle Sheet (Appendix 5-B) every single shift**, so that every person on site knows who to shout for before they need to. A shift with no named, certified provider present does not start.
2. ESC will track expiration dates and re-certify **before** they lapse. A lapsed First Aid/CPR/AED card is treated as a stop-work condition for that shift, not a paperwork item.

5.3.3 First aid supplies (29 CFR 1926.50(d))

1. Per 1926.50(d)(1), first-aid supplies will be easily accessible when required.
2. Per 1926.50(d)(2), "the contents of the first aid kit shall be placed in a **weatherproof container with individual sealed packages for each type of item**, and shall be **checked by the employer before being sent out on each job and at least weekly on each job** to ensure that the expended items are replaced." ESC's weekly kit check is a line item on the Weekly Site Safety Inspection (Appendix 5-D).
3. Kit contents follow the current **ANSI/ISEA Z308.1 Class B** minimum fill for construction/industrial workplaces (referenced in Appendix A to 1926.50 as the guideline for kit contents). Minimum contents on every ESC kit:
   - Adhesive bandages, assorted
   - Adhesive tape
   - Antibiotic ointment, single-use
   - Antiseptic, single-use
   - Breathing barrier (CPR mask with one-way valve)

- Burn dressing (gel-soaked)
- Burn treatment, single-use
- Cold pack
- Eye covering, with means of attachment
- Eyewash (sterile solution)
- First aid guide
- Hand sanitizer
- Medical exam gloves (nitrile) — multiple pairs
- Roller bandage (2 in. and 4 in.)
- Scissors
- Sterile pads
- Trauma pads
- Triangular bandage
- Tourniquet (Class B requirement — and appropriate to ESC's struck-by / caught-in hazards)
- Splint
- Bloodborne-pathogen clean-up kit (biohazard bag, absorbent, disinfectant)

4. ESC will supplement the kit for the actual crew size and hazards on site; the Competent Person may add items but may never remove them.

5.3.4 Automated External Defibrillator (AED)

OSHA does not mandate an AED on a construction site. **ESC provides one anyway.** Cardiac arrest survival falls roughly 7–10% per minute without defibrillation, and ESC crews routinely work at sites where an ambulance is more than four minutes away.

1. **ESC maintains its own AED on site on every project.** The unit's make, model and serial number are read off the device, and the pad and battery expiry dates are read off the pad pouch and the battery itself — **not from memory and not from the invoice** — and recorded here at mobilization and at every weekly inspection:

AED — read from the unit	Entry
Make / model	_____
Serial no.	_____
Location on site	_____
Pads — expiry date on the pouch	_____
Spare pads on site?	**Yes** ☐ **No** ☐ — expiry: _____
Battery — expiry / install-by date	_____
Status indicator green?	**Yes** ☐ **No** ☐
Checked by / date	_____ _____

An AED with expired pads, an expired battery, or anything other than a green status indicator is not a defibrillator — it is a box. It is replaced or restored to service before the shift starts.

1. The AED is inspected on the Weekly Site Safety Inspection: status indicator green, pads in date, spare pads present, battery in date.
2. All ESC first-aid providers are AED-trained.
3. Where the host facility has its own AED (e.g., a public-safety building or school), ESC will additionally record its location on the Emergency Information Sheet — but **ESC does not rely on someone else's AED being available or unlocked.**

5.3.5 Communication and transport (29 CFR 1926.50(e), (f))

1. Per 1926.50(e), proper equipment for prompt transportation of an injured person to a physician or hospital, or a communication system for contacting necessary ambulance service, will be provided. ESC relies on **911 ambulance service**, and maintains a charged phone at the rig at all times. **Cell coverage at the rig is physically tested on the first morning of every project — not assumed — and the result is written on the Site-Specific Emergency Information Sheet.** Where coverage at the work area is inadequate to reach 911 reliably, **work does not start until a working means of summoning emergency services is in place**: a two-way radio link to a crew member standing at a confirmed-coverage point, a landline made available by the GC or the facility, or a satellite messenger. **The means actually in use that day is written on the Emergency Information Sheet and briefed at the huddle.** Even where responders are close by — including where the site itself serves them — ESC does not substitute "someone will see us" for a working phone.
2. Per 1926.50(f), in areas where 911 is not available, the telephone numbers of physicians, hospitals or ambulances will be conspicuously posted. ESC posts them regardless (Appendix 5-A).
3. **ESC employees do not transport a seriously injured person in a company vehicle.** That is what the ambulance is for. Minor injuries may be driven to the occupational clinic by a co-worker, never by the injured employee alone.

5.3.6 Eyewash / quick drenching (29 CFR 1926.50(g))

Per 1926.50(g), where the eyes or body of any person may be exposed to injurious corrosive materials, **suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.** Wet concrete, grout, cement, shotcrete and lime-based stabilizers are strongly alkaline and cause chemical burns. ESC will therefore have **portable eyewash (minimum 2 × 32 oz. sealed bottles, in date, or a 5-gallon gravity-fed unit)** within the immediate work area during **all concrete, grout, cement and shotcrete placement**, and will confirm the location of the nearest drenching water. Eyewash is checked weekly (Appendix 5-D).

5.3.7 Bloodborne pathogens (29 CFR 1910.1030)

Employees designated to render first aid as part of their job duties are covered by the Bloodborne Pathogens standard, 29 CFR 1910.1030. ESC will:

1. Treat all blood and other potentially infectious material as if infectious (universal precautions).
2. Provide nitrile gloves, a CPR breathing barrier, eye protection and a clean-up kit in every first-aid kit.
3. Offer the **hepatitis B vaccination series at no cost** to each designated first-aid provider. (OSHA permits construction employers whose designated providers render first aid only as a collateral duty to offer the vaccine **after** an exposure incident rather than pre-exposure, provided a written plan is in place, exposure incidents are reported, and the series is begun within 24 hours of the exposure. **ESC elects to offer the vaccine PRE-EXPOSURE** to any employee who wants it — it is cheap, and the post-exposure route depends on paperwork being right on the worst day of someone's career.)
4. Report every exposure incident immediately, provide a confidential post-exposure medical evaluation and follow-up at no cost, and maintain the associated medical records confidentially.
5. Contaminated PPE, dressings, gloves and cleanup materials go into a **labeled biohazard bag from the kit's bloodborne-pathogen clean-up kit, sealed, and placed inside a rigid, closed, labeled container carried in the ESC vehicle. Regulated medical waste is never placed in the site dumpster, the GC's dumpster, a spoil pile, or a household trash barrel.** Where an ESC first-aid provider accompanies an injured employee to the treating emergency department or clinic, the sealed bag goes with them and is discharged into that facility's medical-waste stream. Otherwise the sealed container is turned over to a licensed medical-waste hauler. **The disposal route for a given project is confirmed in writing with the General Contractor before mobilization** — many GCs direct all site medical waste into a stream they already have under contract — **and the transfer is recorded in the incident file.**

5.4 Incident Reporting and Investigation

5.4.1 What must be reported — everything

Employees must immediately report to the Competent Person, before the end of the shift and preferably at the moment it happens:

1. Every **injury or illness**, however minor — including a cut, a splinter, an eye irritation, a strain, a burn, a cement burn, a hearing complaint, a respiratory complaint, or heat/cold symptoms. There is no "too small to report."
2. Every **near-miss / close call** — anything that could have caused an injury and did not, only by luck or timing. (A tool dropped near a person. A load that swung. A cave-in of a shaft sidewall with nobody at the collar. An unexpectedly exposed conductor.)
3. Every **property or equipment damage** event — rig, excavator, casing, tooling, vehicle, GC or owner property, pavement, curb, fencing, landscaping, parked cars.

4. Every **utility strike or contact** — buried or overhead, energized or not, damaged or merely exposed/nicked. **Any contact with an overhead conductor is reported to the Treasurer immediately, without exception, and triggers a stand-down.**
5. Every **fire**, however small, including one put out with an extinguisher.
6. Every **spill or release** (fuel, hydraulic oil, slurry, grout, drilling fluid) and every discharge to a drain, catch basin or waterway.
7. Every **equipment upset, tipping, or near-tipping** event.
8. Every **fall arrest activation** (a PFAS that took a load is removed from service permanently).
9. Every **public complaint or third-party incident** (a member of the public inside a barricade; a vehicle striking a barricade; a dust or noise complaint).

ESC will not discipline, and will not permit any supervisor to discipline, an employee for reporting an injury, an illness, a near miss, an unsafe condition, or a safety concern, or for stopping work. Retaliation for such a report is prohibited by Section 11(c) of the Occupational Safety and Health Act and by ESC policy, and is grounds for termination of the retaliating supervisor. ESC's incident data is only worth what its honesty is worth.

5.4.2 Immediate response sequence

1. **Make the scene safe** and care for the injured. Life safety first — always.
2. **Preserve the scene.** Do not move equipment, do not backfill, do not clean up, and do not resume the task until the Competent Person has released it — except where necessary to prevent further harm.
3. **Notify** the Competent Person (Jean Prinsloo) and the Treasurer (Derek Snow) — immediately for anything serious; within the shift for everything else.
4. **Notify the General Contractor** per the subcontract and the site rules.
5. **Assess whether an OSHA report is required under 29 CFR 1904.39** — see Section 5.5. **This clock starts running the moment ESC learns of the event.**
6. **Photograph and document** the scene, the equipment, the conditions and the position of everything before anything is moved (where safe).
7. **Notify the Workers' Compensation carrier** for **any** injury requiring medical treatment. **The carrier, the identifiers and the carrier's claims telephone number are printed on ESC's certificate of insurance, a copy of which is kept in the site box and in each ESC vehicle**, and the claim is filed by the Treasurer through ESC's insurance broker. Nobody is expected to recall an insurance identifier under stress — the certificate is in the box.

5.4.3 Investigation

1. **Every** reported incident and near miss is investigated. The depth of the investigation scales with the **potential** severity, not the actual outcome — a dropped casing section that hit nobody gets the same investigation as one that did.
2. The Competent Person (Jean Prinsloo) leads the investigation. For any serious injury, any hospitalization, any utility strike, any electrical contact, any equipment upset, or any high-potential near miss, the **Treasurer (Derek Snow) participates and signs the report.**
3. Investigation is completed and the report issued **within 5 business days** of the incident. Corrective actions that can be implemented immediately are implemented immediately and do not wait for the report.
4. Investigation steps:
    - Secure and document the scene (photographs, measurements, sketch, weather, ground conditions, lighting).
    - Interview the injured employee and every witness **separately**, promptly, and **non-punitively** — the purpose is to learn what happened, not to find someone to blame.
    - Gather records: the JHA, the daily huddle sheet, the toolbox talk, the daily rig inspection, the training records, the equipment manual, the geotech report, the utility locate tickets, the exposure/task-duration logs.
    - Reconstruct the sequence of events.
    - Identify the **immediate causes** (the unsafe act or condition) and then, mandatorily, the **root causes**.
5. **Root cause analysis.** ESC uses **"5 Whys"** as its standard method, and a causal-factor tree for complex or serious events. The investigation is **not complete** until at least one root cause has been identified that is a **system, management or design cause** — not merely "employee error." "The laborer wasn't paying attention" is never an acceptable final root cause. Push through to: Was the JHA adequate? Was the training adequate? Was the right tool provided? Was the schedule pressure unreasonable? Was the design or sequence flawed? Was the hazard foreseeable and not designed out? Did a supervisor tolerate the shortcut?
6. **Corrective actions.** Each corrective action must be written with: a **specific action**, a **single named owner**, and a **due date**. Corrective actions are ranked by the hierarchy of controls — **elimination → substitution → engineering controls → administrative controls / warnings → PPE.** A corrective action of "retrain the crew" alone is a weak control and will not be accepted as the sole action for a serious event.
7. **Verification.** The Treasurer verifies that each corrective action was actually completed and that it worked, and closes it in the Corrective Action Log (Appendix 5-G). **Open corrective actions are reviewed at every monthly management review, and no incident file is closed with an open action.**
8. **Sharing.** The lessons learned from every investigation are delivered to the crew as a toolbox talk, and — where relevant to the project — to the General Contractor.

5.4.4 Forms

- **Appendix 5-E — Incident / Near-Miss Report** (initial report, filed by any employee, within the shift)
- **Appendix 5-F — Incident Investigation & Root Cause Report** (completed by the Competent Person, within 5 business days)
- **Appendix 5-G — Corrective Action Log** (maintained by the Treasurer, reviewed monthly)

5.5 OSHA Reporting Duties That Survive ESC's Recordkeeping Exemption (29 CFR 1904.39)

5.5.1 ESC's recordkeeping status — and its precise limits

1. ESC had **10 or fewer employees at all times during 2023, 2024 and 2025.** ESC is therefore **partially exempt** from routine OSHA injury and illness recordkeeping under **29 CFR 1904.1(a)(1)** — ESC is not required to maintain the OSHA 300 Log, the 301 Incident Report, or the 300A Summary, unless OSHA or the Bureau of Labor Statistics informs ESC **in writing** that it must keep records under 29 CFR 1904.41 or 1904.42.
2. **This exemption is narrow, and ESC states its limits plainly, because a General Contractor and an OSHA CSHO will both test it:**
    - It is a **size-based** exemption under 1904.1 and applies **regardless of industry**. It does not depend on ESC's NAICS code.
    - **It does NOT exempt ESC from the reporting duties in 29 CFR 1904.39.** 1904.1(a)(1) states expressly that, notwithstanding the partial exemption, "as required by §1904.39, all employers covered by the OSH Act must report to OSHA any workplace incident that results in a fatality, in-patient hospitalization, amputation, or loss of an eye."
    - It does **not** exempt ESC from **any** substantive safety standard in 29 CFR Part 1926 — not the silica standard (1926.1153), not excavations (Subpart P), not fall protection (Subpart M), not electrical (Subpart K), not PPE, not training. Every one of those applies to ESC in full.
    - It does **not** exempt ESC from the exposure-record and medical-record retention duties that attach to specific standards (e.g., 29 CFR 1926.1153(j) and 29 CFR 1910.1020 — exposure records 30 years; medical records duration of employment plus 30 years).
    - It does **not** exempt ESC from the anti-retaliation protections of Section 11(c) of the OSH Act.
    - If ESC's employment ever exceeds 10 employees in any calendar year, **ESC must begin keeping the OSHA 300 Log for the following calendar year.** ESC will confirm its peak headcount at each year-end (Section 5.8.3).

5.5.2 The reporting duties — 29 CFR 1904.39(a)

These duties apply to ESC in full. They are not delegable to the General Contractor. If in doubt, ESC reports.

Event	Deadline	Cite
Work-related FATALITY	**Within 8 HOURS** of learning of it (where the death occurs within 30 days of the work-related incident)	29 CFR 1904.39(a)(1), (b)(6)
Work-related IN-PATIENT HOSPITALIZATION of one or more employees	**Within 24 HOURS** of learning of it (where the hospitalization occurs within 24 hours of the work-related incident)	29 CFR 1904.39(a)(2), (b)(6)
Work-related AMPUTATION	**Within 24 HOURS** of learning of it (where the amputation occurs within 24 hours of the work-related incident)	29 CFR 1904.39(a)(2), (b)(6)
Work-related LOSS OF AN EYE	**Within 24 HOURS** of learning of it (where it occurs within 24 hours of the work-related incident)	29 CFR 1904.39(a)(2), (b)(6)

Definitions ESC uses, per 1904.39(b):

- **"In-patient hospitalization"** means **formal admission to the in-patient service of a hospital or clinic for care or treatment.** Treatment in an emergency room, or being held for observation without formal admission, is **not** reportable. When in doubt, ESC asks the hospital whether the employee was formally admitted — and if the answer is not clearly "no," ESC reports.
- **"Amputation"** means the traumatic loss of a limb or other external body part, including a part such as a fingertip, **with or without bone loss**; it includes fingertip amputations with or without bone loss, medical amputations resulting from irreparable damage, and amputations of body parts that have since been reattached. It does **not** include avulsions, enucleations, deglovings, scalpings, severed ears, or broken/chipped teeth.
- **"Loss of an eye"** means the physical removal of the eye, including enucleation and evisceration. Loss of sight without removal is **not** reportable as loss of an eye — but if it results in in-patient hospitalization within 24 hours, it is reportable on that basis.
- Per 1904.39(b)(7)–(b)(8), if ESC does not learn of a reportable event at the time it happens, the 8-hour or 24-hour clock runs **from the time the event is reported to ESC or to any of its agents or supervisors.**
- Per 1904.39(b)(6), if the event is not reportable at the time it occurs but becomes reportable within 30 days (fatality) or 24 hours (hospitalization/amputation/eye loss) of the incident, ESC must report it when it learns of it.

5.5.3 How ESC reports

ESC will report by **one** of the three means allowed by 29 CFR 1904.39(a)(3):

1. **Telephone the OSHA Area Office nearest to the site during normal business hours** — for the current project, the **OSHA Boston North Area Office**, Shattuck Office Center, 138 River Road, Suite 102, Andover, MA 01810 — **(978) 837-4460** (confirm the Area Office covering the county of any new project); **or**
2. **Telephone the OSHA 24-hour hotline: 1-800-321-OSHA (1-800-321-6742)** — this is the correct number outside business hours and is the one ESC will use by default; **or**
3. **Submit the report electronically** using the reporting application on OSHA's public website, www.osha.gov.

ESC does not report by email, by voicemail, by fax, or by leaving a message with the GC.

5.5.4 Information ESC must give (29 CFR 1904.39(b)(2))

The person making the call will have this ready **before** dialing:

1. The **establishment name** — Earth Support Corp., 56 Broad Street, Suite 32686, Boston, MA 02109
2. The **location of the work-related incident** — the project street address
3. The **time of the work-related incident**
4. The **type of reportable event** — fatality, in-patient hospitalization, amputation, or loss of an eye
5. The **number of employees** who suffered the event
6. The **names** of the employees who suffered the event
7. The **name and phone number of an ESC contact person** — Derek Snow, Treasurer. **The direct number is given to OSHA on the call; this public edition does not print it.**
8. A **brief description** of the work-related incident

5.5.5 Who makes the call

1. **Derek Snow, Treasurer**, makes the report. In his absence, **Jean Prinsloo** makes it. **The call is not delayed for anyone.** If neither can be reached within one hour of a reportable event, the senior ESC employee on site makes the call. Missing an 8-hour or 24-hour deadline is itself a citable violation, and there is no excuse for it.
2. The report, the date and time it was made, the name of the OSHA representative taking it, and any case number given are recorded in the incident file.
3. Notifying the General Contractor, the owner, the insurer or ESC's counsel is **in addition to** the OSHA report, never instead of it.

5.5.6 Events that are NOT reportable to OSHA (29 CFR 1904.39(b)(3), (b)(4), (b)(5))

- A fatality or in-patient hospitalization caused by a **motor vehicle accident on a public street or highway**, **except** in a construction work zone. (An event in a construction work zone **is** reportable.)
- A fatality or in-patient hospitalization that occurs on a **commercial or public transportation system** (airplane, train, subway, bus).
- A **fatality caused by a heart attack at work IS reportable**, per 1904.39(b)(5) — the OSHA Area Director will decide whether to investigate. ESC reports it.

5.5.7 Massachusetts Workers' Compensation reporting (separate duty)

In addition to any OSHA report, ESC must report work injuries to its Workers' Compensation insurer and, where the threshold is met, to the **Massachusetts Department of Industrial Accidents (DIA)** on the **Employer's First Report of Injury or Fatality (Form 101)**, under M.G.L. c. 152.

Item	The rule ESC works to
What triggers a Form 101	The employee is **disabled for five (5) or more full or partial calendar days. The five days do NOT have to be consecutive.**
Deadline to file	**Within seven (7) calendar days — excluding Sundays and legal holidays — after the injured worker's fifth day** of full or partial disability.
How it is filed	**Electronically only**, through a DIA online account. **Paper Form 101 has not been accepted since January 1, 2014.** ESC maintains an active DIA online account so that the filing is never delayed by account setup on the day it is due.
Fewer than five days of disability	**Not** filed with the DIA — handled as a "medical only" claim and reported to the **Workers' Compensation insurer**.

These are two entirely different clocks, and conflating them is how a small contractor gets cited. The DIA 5-day/7-day rule is a **workers' compensation** filing duty. It is completely separate from the OSHA 29 CFR 1904.39 **8-hour / 24-hour reporting** duty in Sections 5.5.2–5.5.3, and separate again from the OSHA 300 Log **recordkeeping** duty ESC is exempt from. **Worked example: an amputation with zero lost days is OSHA-reportable within 24 hours and is NOT DIA Form 101-reportable.** Report to OSHA anyway. The 24 hours does not pause while anyone works out the compensation question.

ESC notifies its carrier of every injury requiring medical treatment, immediately, regardless of the DIA threshold. Where ESC performs work outside Massachusetts, the injury-reporting duty of that state governs; **ESC establishes that state's threshold, deadline and filing method with its carrier and its insurance broker before the crew mobilizes there, and records it in the project file.** ESC does not assume the Massachusetts rule travels.

5.6 Return to Work

1. **Any employee who receives medical treatment for a work-related injury or illness must provide ESC with a written treating-provider release before returning to work.** The release states what the employee can and cannot do.
2. ESC accommodates **modified / transitional duty** wherever it can be provided safely and meaningfully. ESC is a small company doing physically demanding work, and there is not always a light-duty job available on a drill crew; where there is (e.g., documentation, inspections, materials tracking, housekeeping, training review), ESC will offer it.
3. **ESC will not put an employee back on a task the treating provider has restricted him from**, and will not pressure any employee to work outside a medical restriction. A supervisor who does so will be disciplined.
4. **Fitness for duty for respirator use is separate and independent.** Any employee required to wear a respirator (for example, when silica task durations exceed the Table 1 four-hour threshold under 29 CFR 1926.1153) must have a current **medical evaluation by a PLHCP under 29 CFR 1910.134(e) BEFORE fit-testing or use**, must be **fit-tested annually** under 1910.134(f), and must be clean-shaven where the respirator seals. This cannot be arranged on the morning it is needed.
5. Employees returning from an extended absence, or returning to a task they have not performed recently, are re-briefed on the JHA for that task before starting.
6. Medical information related to a work injury is kept **confidential** and separate from personnel files, and is disclosed only as permitted by 29 CFR 1910.1020 and applicable law.
7. ESC does **not** use blanket post-incident drug and alcohol testing as a reflexive response to a reported injury, because a policy that punishes reporting produces silence, not safety. Testing is conducted where there is an objectively reasonable basis to believe drug or alcohol use contributed to the incident, where testing is required by the General Contractor's site rules or by law, or where required by ESC's Workers' Compensation carrier.

5.7 Jobsite Safety Inspections and Audits

5.7.1 The legal basis

Per **29 CFR 1926.20(b)(2)**, ESC will "provide for **frequent and regular inspections** of the job sites, materials, and equipment to be made by **competent persons** designated by the employer." Per **29 CFR 1926.20(b)(1)**, ESC will initiate and maintain such programs as may be necessary to comply with Part 1926. Per **29 CFR 1926.21(b)(2)**, ESC will instruct each employee in the recognition and avoidance of unsafe conditions and in the regulations applicable to his work environment.

Jean Prinsloo (MA CS-122896) is ESC's designated Competent Person and has the authority — and the standing obligation — to stop work immediately, without calling anyone first, to eliminate or minimize any hazard.

5.7.2 Inspection schedule

Inspection	Frequency	Performed by	Form	Retained
Pre-task / daily huddle hazard check	Every shift, before work starts	Competent Person + crew	Appendix 5-B	Project duration + 3 yrs (minimum)
Daily drill rig / equipment inspection	Every shift, before operation (documented, per ANSI/ASSP A10.23 §12.2 and §10.1)	Operator, reviewed by Competent Person	Appendix 5-C	Same

Inspection	Frequency	Performed by	Form	Retained
Excavation / shaft inspection	Daily before each shift, as needed throughout the shift, and **after every rainstorm or other hazard-increasing occurrence**, per 29 CFR 1926.651(k)(1)	Competent Person	Appendix 5-C	Same
Silica control check	Every shift, per 29 CFR 1926.1153(g)(4)	Competent Person	Silica ECP Appendix A	30 yrs where an exposure record
Weekly documented site safety inspection	Weekly, minimum	Competent Person	Appendix 5-D	Same
Management site visit / audit	Monthly, minimum, on every active project	Derek Snow, Treasurer	Appendix 5-D (audit section)	Same
Annual program audit	Annually	Derek Snow, Treasurer, with Jean Prinsloo, Competent Person — the whole company, in one room, against this manual	Appendix 5-I	Permanently
Post-incident inspection	After every incident or near miss	Competent Person	Appendix 5-F	Same

5.7.3 What the weekly inspection covers (minimum)

- Emergency: EAP posted and current; crew assembly point identified; first aid kit stocked and checked; AED status green and pads in date; eyewash present and in date; extinguishers charged, tagged and accessible; emergency access route clear
- Fall / open holes: every shaft either concreted, covered (secured and marked "HOLE"/"COVER"), or guarded; casing stickup at collars; no unprotected edges
- Excavation: protective system in place; spoil set back; access/egress; water; adjacent structures
- Restricted access zone: swing radius fully barricaded; RAZ moved with the work; spin-off arc included; no intruders
- Equipment: rig level and within manufacturer's tolerance; tracks extended; mats/cribbing; auxiliary winch used only within manufacturer's limits; operator's manual **on the rig**; daily inspections documented
- Overhead conductors: identified; clearance maintained; warning line / spotter in place; no mast raising or travel beneath a conductor
- Underground utilities: locate tickets current; marks intact; soft-dig completed where required
- Silica: water at the bit; nozzles clear; hoses intact; dust collector filters and bags serviced; spoil wet; **no dry sweeping; no compressed air used to clean tooling, holes, surfaces or clothing** (29 CFR 1926.1153(f))
- Electrical: GFCI; cords; temporary power; lockout/tagout
- PPE: hard hats, eye protection, hi-vis, boots, gloves, hearing protection; respirators where required, with current fit test and medical evaluation
- Housekeeping, access routes, materials storage, rigging condition
- Traffic / public protection: barricades; signage; flagging; pedestrian routing
- Documentation on site: JHAs; toolbox talks; training records; SDSs; this manual

5.7.4 Findings and closure

1. Every finding is written down with a **severity rating**, a **named owner** and a **due date**.
2. **Imminent-danger findings are corrected on the spot, and work in that area stops until they are.**
3. Findings not closed by their due date escalate to the Treasurer.
4. Open findings are reviewed at the monthly management review. The **percentage of findings closed on time** is one of ESC's leading indicators (Section 5.9).
5. **Repeat findings are treated as a program failure, not a crew failure**, and trigger a root-cause review of the underlying system (training, tooling, planning or supervision).

5.8 Job Hazard Analysis (JHA), Pre-Task Planning and Toolbox Talks

5.8.1 The JHA process

ESC's JHA process satisfies **29 CFR 1926.21(b)(2)** (employee instruction in the recognition and avoidance of unsafe conditions) and **ANSI/ASSP A10.23 §4.1**, which requires the drilled-shaft contractor to develop a **written site-specific safety plan and Job Hazard Analyses for unique drilled shaft activities prior to initiating drilled shaft operations**, and **§4.2**, which requires the Competent Person to review the plan and the JHAs with all workers potentially exposed.

A JHA is written before:

1. Any **drilled shaft, soil-nail, shoring, underpinning or slope-stabilization operation** — always, on every project, before the first day of work.
2. Any **new task** or any task the crew has not performed at this site.
3. **Mobilization, rig assembly/erection, mast raising, rig relocation, and demobilization.**
4. Any **non-routine, high-energy or high-consequence activity** — casing installation and extraction; rebar cage picks; concrete/grout placement and tremie work; hoe-ramming; rock socketing; work near overhead conductors; work near known buried utilities; soft-dig; crane picks; hot work.
5. Any work in a **live / occupied environment** (an active parking lot, an operating facility, a public right-of-way).
6. **Any change** in conditions, method, sequence, equipment, subsurface conditions or crew composition. **A JHA that no longer matches the work is worse than no JHA.**
7. **After any incident or high-potential near miss** involving that task.

JHA content, at minimum: the task, broken into steps in sequence; the hazards of each step; the controls for each hazard, selected by the **hierarchy of controls**; the PPE; the competent/qualified persons required; the emergency provisions; and the specific regulatory references (e.g., 29 CFR 1926.651, 1926.501, 1926.1153, 1926.416, ANSI/ASSP A10.23).

Who writes and signs it:

Role	Responsibility
Competent Person (Jean Prinsloo)	Prepares or approves the JHA; reviews it with **every** exposed worker; signs it
Every crew member performing the task	Reviews it, has the opportunity to challenge and add to it, and **signs it** — a JHA the crew did not help write is a piece of paper, not a control
Treasurer (Derek Snow)	Approves JHAs for high-consequence activities (power-line proximity, casing extraction, cage picks, crane work, hot work, any work where a life-safety control is the only thing between a worker and a fatality)
General Contractor	Receives the JHA and the site-specific safety plan. Per ANSI/ASSP A10.23 §4.1 the plan is to be **reviewed and approved by the project constructor**; ESC will transmit it and request written acknowledgment, and will request the §6.1.3 preconstruction meeting

Copies of the plan and the JHAs are **maintained at the project and available for review until the operations are complete** (A10.23 §4.2). The JHA is revised whenever procedures change, and the change is communicated to all personnel involved (A10.23 §4.3).

5.8.2 Daily pre-task planning ("the huddle")

Every ESC shift begins with a documented pre-task huddle. No exceptions, no "we did it yesterday." It is led by the Competent Person, takes 5–15 minutes, and covers:

1. **The work planned today**, step by step, and who is doing what.
2. **The JHA(s)** in effect for today's tasks — reviewed, not just referenced.
3. **What changed since yesterday** — weather, ground conditions, groundwater, subsurface surprises, new trades on site, new equipment, new crew, GC direction.
4. **The specific hazards today** — overhead conductors, buried utilities, open shafts, the swing radius, the exclusion zone, traffic, the public.
5. **Silica task durations** — who is doing what for how long, and whether the 4-hour Table 1 aggregation threshold under 29 CFR 1926.1153(c)(3) will be crossed today. If it will, the respirators, the fit tests and the medical evaluations must already be in place. This is decided at the huddle, not at hour four.
6. **Emergency information** — the crew assembly point, the hospital, who the trained first-aid provider is today, where the AED and the kit are.
7. **Stop-work authority** — restated. Every crew member, every day: "*You can stop this job. Anyone can give an emergency stop signal. Nobody gets in trouble for it.*" (ANSI/ASSP A10.23 §12.15 — the emergency stop signal may be given by **any** worker.)

8. **Questions and pushback.** The huddle is not a briefing delivered at the crew; it is a conversation in which the people doing the work are asked what they think will go wrong.

The huddle is recorded on the **Daily Pre-Task Plan / Huddle Sheet (Appendix 5-B)** and signed by everyone present, including visitors and other trades working inside ESC's restricted access zone.

5.8.3 Toolbox talks

1. ESC holds a **toolbox talk at least weekly** on every active project, plus **immediately** after any incident, near miss, stand-down, or significant change in conditions.
2. The talk is delivered by the Competent Person, is specific to ESC's actual work (not a generic download), lasts 10–20 minutes, and allows time for questions.
3. Attendance is recorded on the **Toolbox Talk Record (Appendix 5-H)**, signed by each attendee, with the topic, date, presenter and any actions arising.
4. Standing topic rotation for ESC (each topic covered at least annually, and always before the relevant work begins):
    - Open holes, shaft covers, and the **no-man-entry policy**
    - Fall protection at the shaft collar; casing stickup as a guardrail
    - Overhead power lines: clearance, spotters, **stay in the cab** on contact, step potential
    - Underground utilities, locate tickets, soft-dig, and what to do on a strike
    - Rig stability, ground bearing, mats, and the auxiliary winch limits — **the rig is not a crane**
    - Swing radius, restricted access zones, spin-off, and signal persons
    - Respirable crystalline silica: the four required hazards — **cancer, lung effects, immune system effects and kidney effects** (29 CFR 1926.1153(i)(1)) — the Table 1 controls, the 4-hour rule, the no-dry-sweeping and no-compressed-air rules, and the identity of the Competent Person
    - Excavation, soil classification, cave-in, spoil setback
    - Rigging, cage picks, taglines, loads overhead
    - Concrete and grout: chemical burns, eyewash, pump line pressure
    - Struck-by, caught-between, and the vehicle/equipment traffic plan
    - Hand and power tools; hearing conservation
    - Heat illness and cold stress
    - Housekeeping, slips/trips/falls, egress
    - Emergency Action Plan, first aid, AED, and this month's site-specific emergency information
    - Incident and near-miss reporting — **and why nobody gets punished for it**

5.9 Safety Performance Measurement

5.9.1 ESC's actual record — stated exactly, and no further

Earth Support Corp. has had ZERO OSHA-recordable injuries and illnesses in the past three years (2023, 2024, 2025).

ESC will not state, and no ESC employee or estimator may state on a prequalification form, in a bid, or to a General Contractor, any **TRIR, DART rate, LTIR, or Experience Modification Rate (EMR)** unless that figure has been produced by the appropriate source and is documented:

- **EMR** is computed by the rating bureau and issued by ESC's Workers' Compensation carrier and broker — **not by ESC, and not by ESC's estimator.** ESC does not state an EMR figure in this manual, on a prequalification form, or in a bid, because a number ESC types is not an EMR; a number the bureau issues is. **ESC's current Experience Modification Rate letter is issued directly by ESC's insurance broker, to any general contractor, owner or awarding authority that requests it.** ESC will make that request on the requesting party's behalf, same day, on a phone call. The letter arrives on the broker's letterhead, carries its own effective date, and is the only version of this number that is worth anything to a General Contractor.
- **TRIR / DART** are calculated from the OSHA 300 Log. **ESC is partially exempt from maintaining the 300 Log under 29 CFR 1904.1(a)(1) and therefore does not maintain one.** Where a prequalification form requires a rate, ESC answers truthfully: "*Earth Support Corp. is partially exempt from routine OSHA injury and illness recordkeeping under 29 CFR 1904.1(a)(1) (10 or fewer employees at all times during the relevant years) and does not maintain an OSHA 300 Log. ESC has had zero OSHA-recordable injuries or illnesses in the past three years. ESC maintains an internal incident register and can provide it on request.*"
- **ESC will never invent a number to fill a box on a form.** A fabricated safety statistic is a fraudulent representation to the GC and the owner, and it is a fireable offense.

5.9.2 Internal incident register (kept regardless of the exemption)

Although not required to keep the OSHA 300 Log, **ESC maintains an internal incident register** that captures, for every event:

- Date, project, employee(s) involved, task
- Event type (injury / illness / near miss / property damage / utility strike / spill / fire / equipment upset)
- Actual severity and **potential** severity
- Whether it would have been OSHA-recordable had ESC been required to keep the log (ESC applies the 29 CFR 1904.7 recording criteria for its own internal analysis)
- Whether it was reportable under 29 CFR 1904.39, and if so, when it was reported and to whom
- Root cause(s), corrective actions, owners, due dates, closure date and verification

The register is **reviewed monthly by the Treasurer** and **summarized annually**. It is available to a General Contractor or an OSHA CSHO on request. If ESC's headcount ever exceeds 10 in a calendar year, this register makes the transition to the formal 300 Log trivial.

5.9.3 Leading indicators — what ESC actually manages to

A zero-recordable record over three years is real, but it is a **lagging** indicator and, at ESC's size, it is also a small-numbers artifact. **ESC does not treat "zero" as proof that the program is working.** ESC manages the following leading indicators, reported monthly:

Leading indicator	Target
Daily pre-task huddles held and documented	100% of shifts worked
Daily equipment / excavation inspections documented	100% of shifts worked
Weekly site safety inspections completed	100% of project-weeks
Toolbox talks delivered and signed	≥ 1 per week per active project
JHA in place and signed before each new task	100%
Near misses reported	**Reported, not suppressed — a month with zero near-miss reports is investigated as a reporting failure, not celebrated**
Corrective actions closed by their due date	≥ 95%
Repeat findings	Zero; any repeat triggers a root-cause review
Training and certification currency (First Aid/CPR/AED, OSHA 10/30, silica, respirator fit test and medical evaluation, operator qualification)	100% current; zero lapses
Stop-work events	Tracked and **reviewed positively** — a stop-work event is a success of the program
OSHA 1904.39 reports made within the 8-hour / 24-hour deadline	100% (target and expectation: no reportable events at all)

5.9.4 Monthly management review

The Treasurer and the Competent Person meet monthly (documented) to review: incidents and near misses; the corrective action log; inspection findings and closure rates; training currency; upcoming high-risk work; and any changes in law, standards or ESC's methods. Actions are assigned with owners and dates.

5.10 Manual Review, Revision Control and Document Distribution

5.10.1 Review cycle

1. **This Safety & Health Program is reviewed in full at least annually** by the Treasurer, with the Competent Person, and is updated as necessary. (The annual review requirement is explicit for the silica written exposure control plan at **29 CFR 1926.1153(g)(2)**; ESC applies the same annual cycle to the entire manual.)
2. The manual is also reviewed and revised **immediately** whenever:
   - An OSHA standard or an applicable consensus standard (e.g., ANSI/ASSP A10.23) changes
   - ESC adopts new equipment, a new method, a new tool, or enters a new trade or state
   - An incident, near miss, inspection or audit reveals a gap in the manual
   - ESC's headcount, structure, insurance or key personnel change
   - A General Contractor or an OSHA CSHO identifies a deficiency
3. The review itself is documented — **the manual is not "reviewed" unless the review is recorded, signed and dated.**

5.10.2 Revision control

Every part of this manual carries the revision block below. **Superseded versions are removed from circulation and from every site box and vehicle, and one controlled archive copy of each superseded revision is retained by the Treasurer.** An out-of-date manual in the field is a liability, not a backup.

Rev.	Date	Sections changed	Reason for change	Prepared by	Approved by
1.0	**July 14, 2026**	All — initial issue	Initial issue	Earth Support Corp.	Derek Snow, Treasurer

Document control:

- **Document owner / approver:** Derek Snow, Treasurer — support@earthsupportcorp.com. Derek Snow signs company documents.
- **Current revision: 1.0 Effective date: July 14, 2026 Last annual review:** *not applicable — initial issue* **Next review due: July 14, 2027**
- **Controlled copies held at:** the ESC office (56 Broad Street, Suite 32686, Boston, MA 02109); each site box on each active project; each ESC vehicle; and the **controlled electronic master, held in ESC's document-control folder and maintained by the Treasurer, who is the only person authorized to issue a revision or withdraw a superseded copy.** A printed copy that does not match the current revision number in Section 5.10.2 is not a controlled copy and is removed from the field.
- **Distribution:** a copy is provided to **every ESC employee at hire and at every revision**, and is available to any employee, any designated employee representative, the Assistant Secretary of Labor and the Director of NIOSH, for examination and copying, on request and at no cost (per, e.g., 29 CFR 1926.1153(g)(3) for the silica exposure control plan).
- **Transmittal to the General Contractor:** ESC provides this manual, its site-specific safety plan, and its JHAs to the GC on award and before mobilization.

5.10.3 Approval and acknowledgment

APPROVED AND ISSUED: _____ Date: _____ **Derek Snow**, Treasurer, Earth Support Corp. **COMPETENT PERSON ACKNOWLEDGMENT** — I have read this Safety & Health Program, I understand my authority and my duty to stop work to eliminate or minimize hazards, and I will implement it. _____ Date: _____ **Jean Prinsloo**, Site Safety Supervisor / Competent Person, MA CS-122896 **EMPLOYEE ACKNOWLEDGMENT** — I have received a copy of the Earth Support Corp. Safety & Health Program. It has been reviewed with me. I understand that I may stop work at any time for a safety concern, that I must report every injury, illness, near miss and unsafe condition, and that I will not be disciplined for doing so. Employee (print): _____ Signature: _____ Date: _____

5.11 Appendix Index of Forms

All forms are controlled documents under Section 5.10.2. Completed forms are retained by the Treasurer for the periods indicated. **Blank masters are held in ESC's controlled document-control folder, maintained by the Treasurer, and a printed pad of each field form (5-A through 5-C, 5-E and 5-M) is stocked in every site box before mobilization.** A crew that cannot find the form does not fill it in.

Appendix	Form	Completed by	Frequency	Retention
5-A	Site-Specific Emergency Information Sheet (§5.1.11)	Competent Person	Per project; updated on change	Project + 3 yrs
5-B	Daily Pre-Task Plan / Huddle Sheet (with crew signatures)	Competent Person + crew	Every shift	Project + 3 yrs
5-C	Daily Equipment, Rig and Excavation Inspection (ANSI/ASSP A10.23 §12.2; 29 CFR 1926.651(k))	Operator / Competent Person	Every shift	Project + 3 yrs
5-D	Weekly Site Safety Inspection & Monthly Management Audit Checklist (§5.7.3)	Competent Person / Treasurer	Weekly / monthly	Project + 3 yrs
5-E	Incident / Near-Miss Report (initial)	Any employee	Every event	5 yrs
5-F	Incident Investigation & Root Cause Report (5 Whys)	Competent Person (+ Treasurer for serious events)	Every event	5 yrs
5-G	Corrective Action Log	Treasurer	Continuous; reviewed monthly	5 yrs
5-H	Toolbox Talk Record / Training Roster (topic, date, presenter, signatures)	Competent Person	Weekly / per training	Duration of employment + 3 yrs
5-I	Annual Program Audit & Management Review Record	Treasurer	Annually	Permanent
5-J	Job Hazard Analysis (JHA) template (§5.8.1)	Competent Person + crew	Per task; revised on change	Project + 3 yrs
5-K	Employee Safety Program Acknowledgment (§5.10.3)	Each employee	At hire and at each revision	Duration of employment + 3 yrs
5-L	Internal Incident Register (§5.9.2)	Treasurer	Continuous	5 yrs minimum
5-M	Stop-Work / Hazard Report Card (any employee, no blame, no name required)	Any employee	As needed	3 yrs

Records governed by a specific standard are retained under that standard, not under the table above. In particular: exposure monitoring records and objective data — **30 years**; employee medical records — **duration of employment plus 30 years** — per 29 CFR 1926.1153(j) and 29 CFR 1910.1020. **ESC's partial exemption from routine injury and illness recordkeeping under 29 CFR 1904.1(a)(1) does not shorten these retention periods.**

End of Part 5.

APPENDIX INDEX

All forms are controlled documents under Part 5, Section 5.10.2. **Blank masters are held in ESC's controlled document-control folder, maintained by the Treasurer; a printed pad of each field form is stocked in every site box before mobilization.** Completed forms are retained by the Treasurer for the periods stated in Part 5, Section 5.11 and Part 1, Section 1.12.4.

Part 2 — Health Hazards, PPE & Exposure Control

Appendix	Form
2-A	Competent Person Daily/Shift Silica Control Checklist
2-B	Silica Task Duration and Respirator-Day Log (per employee, per shift)

Appendix	Form
2-C	PPE Hazard Assessment Form (per project / per task)
2-D	Table 1 Silica Quick-Reference Card (laminated; truck and rig)
2-E	Chemical Inventory and SDS Index
2-F	Respirator Medical Evaluation / Fit Test Roster
2-G	Project-Specific Silica Addendum (one per project)

Part 3 — Drilled Shaft & Foundation Drilling Operations

Appendix	Form
3-A	Daily Drill Rig Inspection Form
3-B	Overhead Line Survey Form and Utility Voltage Request Letter (2-working-day clock per 29 CFR 1926.1408(c))
3-C	Power Line Encroachment Prevention Checklist
3-D	Dedicated Spotter and Qualified Signal Person Designation
3-E	Utility Clearance Form (Dig Safe ticket, member responses, private locates, GPR, soft-dig record)
3-F	Utility Strike Response Card (pocket card)
3-G	Drilled Shaft JHA
3-H	Pre-Task / Toolbox Briefing Form
3-I	End-of-Shift Open Hole Checklist
3-J	Shaft Cover Detail and Capacity Calculation (2× axle load where in a vehicular aisle)
3-K	Lift Plan (auxiliary winch)
3-L	Operator Qualification & Authorization Record
3-M	Emergency Action and Shaft Rescue Plan (site-specific)
3-N	Silica Task Duration Log and Competent Person Silica Control Checklist (cross-reference Part 2, Section 2.3)

Part 4 — Lifting, Rigging, Concrete & General Construction Safety

Appendix	Form
4-A	Rig Configuration Record and Manufacturer's Stability / Range Chart
4-B	Rigging Inventory and Inspection Log
4-C	Internal Traffic Control Plan (ITCP) — marked-up site plan and sign-off

Part 5 — Emergency Response, Incident Management & Program Assurance

Appendix	Form
5-A	Site-Specific Emergency Information Sheet
5-B	Daily Pre-Task Plan / Huddle Sheet (with crew signatures)
5-C	Daily Equipment, Rig and Excavation Inspection
5-D	Weekly Site Safety Inspection & Monthly Management Audit Checklist
5-E	Incident / Near-Miss Report (initial)
5-F	Incident Investigation & Root Cause Report (5 Whys)
5-G	Corrective Action Log
5-H	Toolbox Talk Record / Training Roster
5-I	Annual Program Audit & Management Review Record
5-J	Job Hazard Analysis (JHA) template
5-K	Employee Safety Program Acknowledgment
5-L	Internal Incident Register
5-M	Stop-Work / Hazard Report Card

JOB HAZARD ANALYSES — JHA-01 THROUGH JHA-12

ESC maintains **twelve** standing Job Hazard Analyses covering the drilled-shaft scope. Per **ANSI/ASSP A10.23 §4.1**, the applicable JHAs are written **before** drilled-shaft operations begin; per **§4.2**, the Competent Person reviews each JHA **with every worker exposed to the operation**, and every crew member signs it; per **§4.3**, a JHA is revised whenever the procedure changes, and the change is communicated to everyone involved. Copies are maintained on the project until the work is complete (Part 5, Section 5.8.1).

JHA	Activity	Principal hazards	Primary sections of this manual
JHA-01	**Mobilization and Demobilization**	Transport and offload, tipping off the trailer, struck-by, pinch points, overhead clearance on the route, site restoration, leaving a hazard behind	Part 3 §3.2; Part 4 §4.2
JHA-02	**Rig Setup, Ground Bearing and Mast Raising**	Rig overturn, inadequate working platform, out-of-level machine, mast inclination, **assembly/disassembly below a conductor (PROHIBITED)**, undermining at the collar	Part 3 §3.3, §3.4.10; Part 4 §4.1.6
JHA-03	**Working Near Overhead Power Lines**	Electrocution, touch and step potential, encroachment, travel with the mast up, **operator stays in the cab on contact**	Part 3 §3.4; Part 4 §4.1.10, §4.6.1
JHA-04	**Utility Locating and Soft-Dig (incl. pier locations C2B, C2C and C2E)**	Gas, electric, water, sewer and communications strikes; unmarked private facilities; adjacent septic leach field and stormwater basin	Part 3 §3.5; Part 4 §4.4.2

JHA	Activity	Principal hazards	Primary sections of this manual
JHA-05	**Auger Drilling**	Caught-in / entanglement with the rotating auger, kelly and drive; spin-off struck-by; silica; noise; rig stability	Part 3 §3.6, §3.8; Part 2 §2.3
JHA-06	**Rock Coring / DTH / Socketing**	Respirable crystalline silica (**Table 1 (ix)/(vi)** controls; the air-flush gap), flying rock, extreme noise (dual hearing protection), vibration, boulders 1–2.5 ft	Part 3 §3.8; Part 2 §2.3, §2.5
JHA-07	**Tooling Changeout**	Crush and amputation in the tool connection, dropped tooling, suspended loads, hands in the line of fire, rigging failure	Part 3 §3.6.7; Part 4 §4.1.9
JHA-08	**Open Shaft Protection**	**Fall into the shaft; step-in; objects dropped into the shaft; the "killer state" — a shaft excavated but not being worked.** Cover (secured + marked) and barricade	Part 3 §3.9; Part 4 §4.4.7
JHA-09	**Rebar Cage Rigging and Setting**	PE-designed cage lift points, cage collapse in the pick, suspended load, crush at the collar, impalement, ~727 lb cage	Part 3 §3.7.5; Part 4 §4.1.5, §4.3.1
JHA-10	**Concrete Placement (tremie / pump)**	Pump-line whip and blowout, tremie string drop, cement chemical burns, eye injury, reaching over an open shaft, rebar impalement	Part 3 §3.12; Part 4 §4.3.2, §4.3.4
JHA-11	**Temporary Casing — Installation and Extraction**	Suspended casing on the drill rig's auxiliary winch, crush at the collar, **extraction force is a tipping force**, bound casing, groundwater 5.8–13.5 ft	Part 3 §3.7.6, §3.7.7
JHA-12	**Spoils Handling and Traffic Control in an Active Lot**	Struck-by in an occupied, active lot, backing, public and emergency-vehicle traffic, spoil surcharge and dust, blocked emergency access route	Part 3 §3.11; Part 4 §4.8, §4.2

JHA COVER SHEET AND CREW SIGN-OFF (MASTER FORM)

> **This form is completed IN THE FIELD, ON THE DAY OF THE WORK, by the crew actually present. It is never pre-filled. Pre-filling a date, a crew name or a signature on a safety record is falsification of a safety record (Part 1, Section 1.7.3).**

EARTH SUPPORT CORP. — JOB HAZARD ANALYSIS

JHA No.: _____ Activity: _____

Project: _____ Site address: _____

Pier / location: _____ Date of Work: _____ Prepared By: _____

Competent Person (print): _____ Signature: _____

Weather / ground conditions today: _____

Changes since the last shift: _____

Step	Hazard	Control (hierarchy of controls)	PPE required
1			
2			
3			
4			
5			
6			

Emergency information reviewed with the crew today: 911 · Nearest ED: _____ · ESC Competent Person (Jean Prinsloo): _____ · ESC Treasurer (Derek Snow): _____ · Crew assembly point: _____ · Emergency access route clear: □

Stop-work authority restated today: "*You can stop this job. Anyone can give an emergency stop signal. Nobody gets in trouble for it.*" □

CREW SIGN-OFF — I have reviewed this JHA, I understand the hazards and the controls, I had the opportunity to add to it, and I know I can stop the work.

#	Crew Member (print)	Signature	Date
1			
2			
3			
4			
5			
6			
7			
8			

Other employers / visitors inside the Restricted Access Zone today (print, sign, date):

#	Name (print)	Company	Signature	Date
1				
2				

*End of the Earth Support Corp. Written Safety & Health Program — **Revision 1.0-G (public edition)**, effective July 14, 2026. Next scheduled review: July 14, 2027.*

This is the public edition, published for prequalification review. Project-specific appendices, the certificate of insurance and completed site-specific cards are issued per project on request — support@earthsupportcorp.com. ESC's designated Competent Person completes every site-specific field on the project's own copy before the first shift.