MIIA

Nonprofit
Locally based
Member driven

Serving Massachusetts communities since 1982

OSHA Administrative Training for Transfer Stations

Compactors

Provided by MIIA

Developed and Presented
by Lynn Rose, EHS/P2 Solutions

Presentation Overview

- Compactor Hazards
- OSHA Requirements
- Roles and Responsibilities
  - Town
  - Vendors
  - Attendants

Resources for Attendants

There is a complementary *Attendants' Program* which provides an overview of:

1. compactor hazards
2. work practices

A recorded training will be posted on the MIIA website as part of the TS series for attendants.

Employee Supervision

All personnel supervising TS attendants

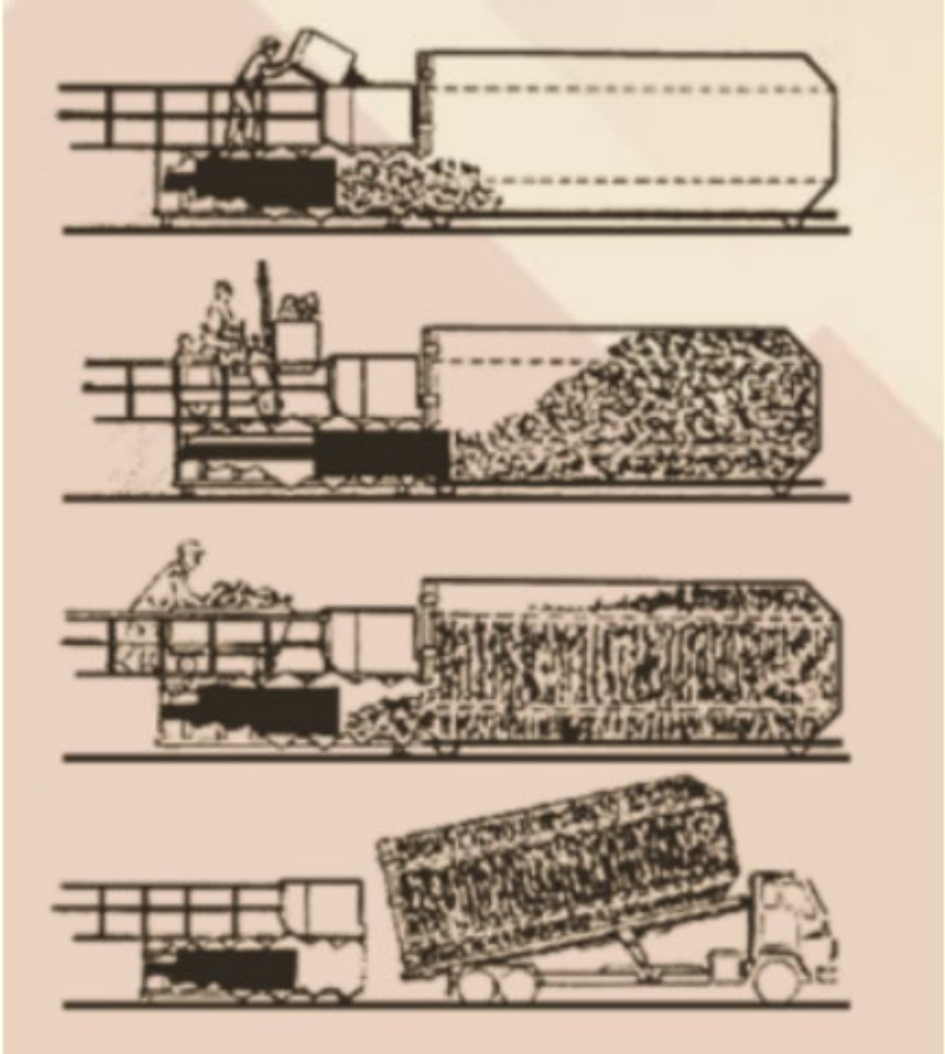
should review the attendant's training and work practices

in addition to the administrative training and guidance.

Compactor Hazards

Severe hazards exist due to their:

- size
- configuration
- operation

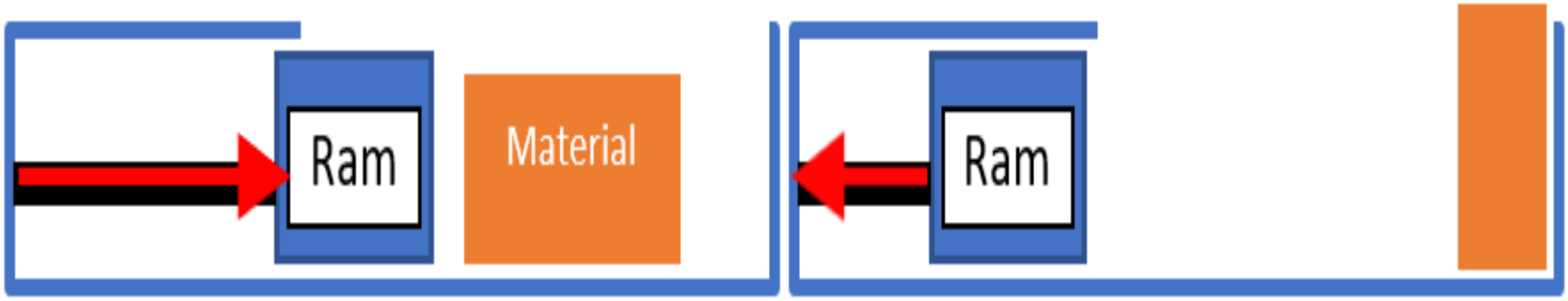


https://www.fleetgenius.com/a-guide-to-commercial-trash-compactors-what-they-are-how-they-work-benefits-types/

Compactor Hazards

Compactors use a large ram and high compression force from hydraulic pressure to compact materials against a heavy, reinforced discharge door.

Ram – The ram operates reciprocally, with forward and back action.



Cropped from an illustration at https://www.komarindustries.com/the-komar-crunch/auger-compactor-vs-ram-compactor

Compactor Hazards

Hazards are encountered when:

- Feeding materials into compactor.
- Clearing jams.
- Retrieving items.
- Cleaning, repairing, or maintaining compactor.

Source: weeklysafety.com, volume 2, issue 46, Heavy equipment, Trash Compactors

Compactor Hazards

Types of access posing hazards:

- direct access to the compression chamber
- a hopper or chute through which material feeds into the machine

FACE Fatal Accidents – 1992-2002

NIOSH Fatality Assessment and Control Evaluation of 20 Reports of Compactor Related Fatalities

- All the fatally injured were either caught in or crushed by the machine.
- In 13 of these cases, the victim was either:
  - crushed in the compacting chamber, or
  - suffered amputation from being caught between the ram and the compacting chamber walls.

FACE Fatal Accidents – 1992-2002

- In all cases the victim either reached in or fell into the compression chamber.
- Happened when:
  - Compactor cycled automatically when the victim entered the compacting chamber.
  - Coworkers activated the machine without knowing that a worker was inside the compacting chamber.

FACE Fatal Accidents – 1992-2002

- Happened when, continued:
  - The victim had been in the process of clearing jammed material.
  - The victim was attempting to retrieve material from the machine.

NEWS

Man crushed by trash compactor while trying to retrieve friend's phone

by: Tribune Media Wire
Posted: Nov 7, 2018 / 04:32 PM EST
Updated: Nov 7, 2018 / 04:32 PM EST

Most Common Compactor Hazards

Caught-In/

Caught-Between

Struck-By

Source: weeklysafety.com, volume 2, issue 46, Heavy equipment, Trash Compactors

Applicable OSHA Standards

Although there is no specific OSHA standard for compactors, these four OSHA standards apply:

Fall Protection

Machine Guarding

Confined Space

Lock Out/Tag Out

Fall Protection

OSHA 1910.28

Fall Hazards

Unprotected or Inadequately Protected Edges

Note – Entry into this compactor opening opening requires lock-out/tag-out.

https://www.wcvb.com/article/southborough-massachusetts-vehicle-stuck-trash-compactor/45589193

https://www.upi.com/Odd_News/2022/04/06/Millinocket-Transfer-Station-trash-compactor-car-stuck/8181649274991/

Fall Protection–OSHA Requirements

Duty to have fall protection, including:

Any condition on a walking–working surface that exposes an employee to a risk of harm from a fall:

1. **to a lower level**
2. **on the same level**

Note that this topic is also covered in in the Fall Protection PPT for situations other than the compactor.

Fall Protection–OSHA Requirements

Application at TS:

Protection from

unprotected sides and edges on *walking–working surfaces*

that are 4 feet or more above a lower level, or

less if the area below is unsafe.

Fall Protection
Possible MIIA Exceptions to Mitigate Risk

Remember!!!

OSHA is a minimum standard

and

is not completely protective of all fall hazards at the transfer station.

Inadequately Protected Edges

Important

OSHA guardrail requirements for protecting *people for Fall Protection*

<u>are inadequate</u>

for stopping a car from driving through at 5 MPH!

Click on link to see video: https://whdh.com/news/surveillance-video-shows-driver-crash-car-into-trash-compactor-in-southboro/

Hazards – *Completely* Unprotected Edges and Openings

When disposing items, operating equipment, retrieving items, and clearing jams.

Hazards – *Completely* Unprotected Edges and Openings

Fall Protection as a Machine Guard

The same mechanisms that prevent falls into the compactor, also prevents injuries and exposures to moving parts and materials inside when feeding materials into the compactor.

Fall Protection – Requirements

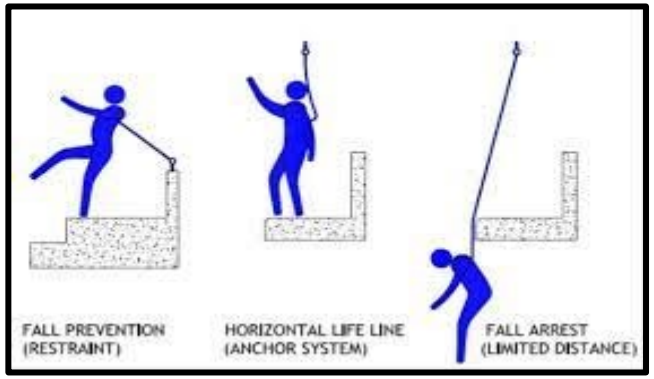
Employees must be protected from falling by one or more of the following:

A. Guardrail systems

B. Safety net systems

C. Personal fall protection systems:

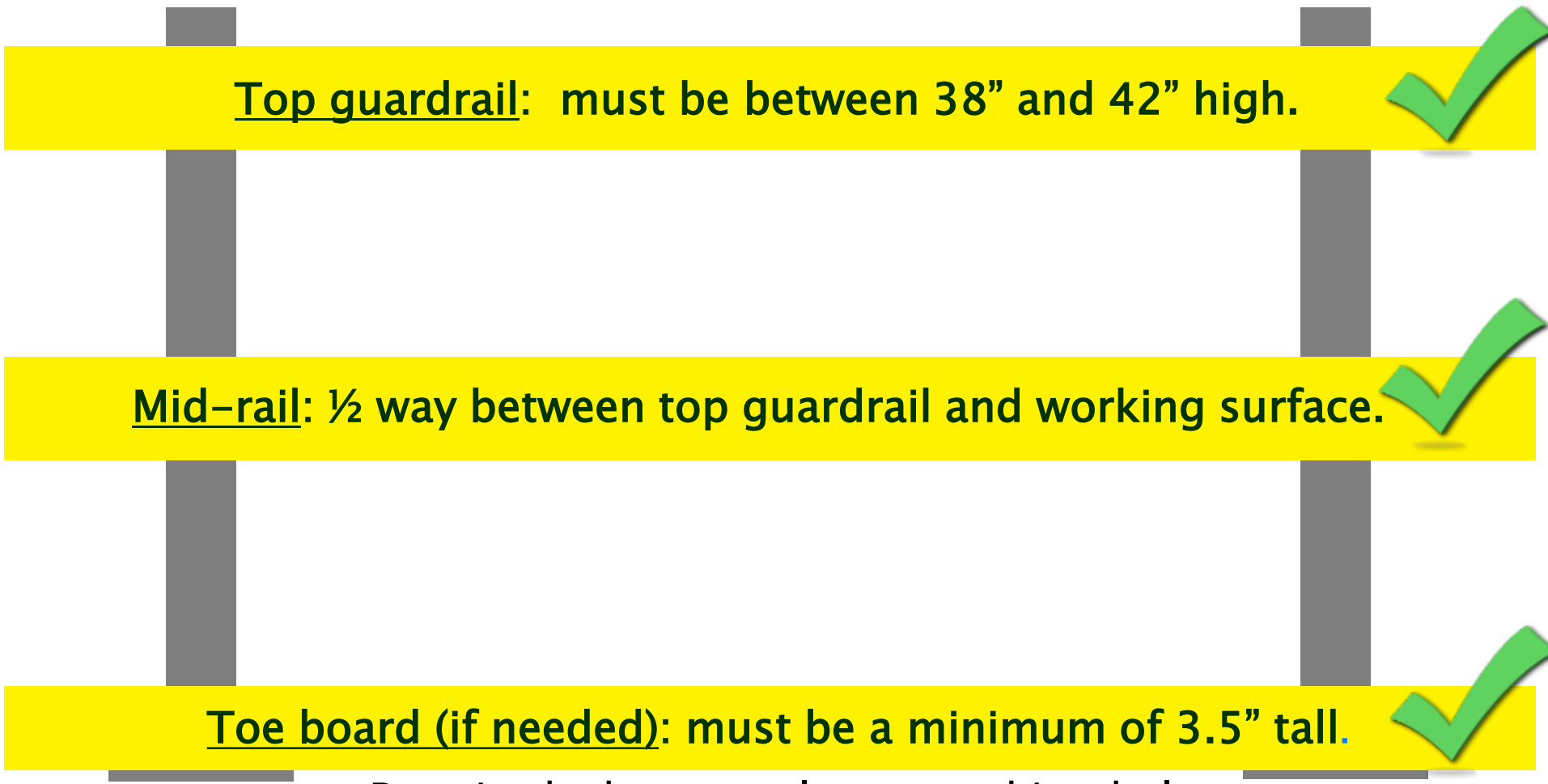
- travel restraint
- personal fall arrest
- positioning systems



https://www.saiosh.co.za/news/529793/PPE-for-Fall-Restraint-vs-Fall-Arrest--What-is-the-difference.htm

Fall Protection Methods – Guardrails

Requirements for unprotected edges below 4 feet



Required when people are working below.

All of the guardrails must be a minimum 1/4” in diameter.

Do dog doors and chains protect users when they are open with no fall protection?

Although these access configurations enable easy access, they do <u>not</u> provide fall protection.

Fall Protection Methods – Guardrails

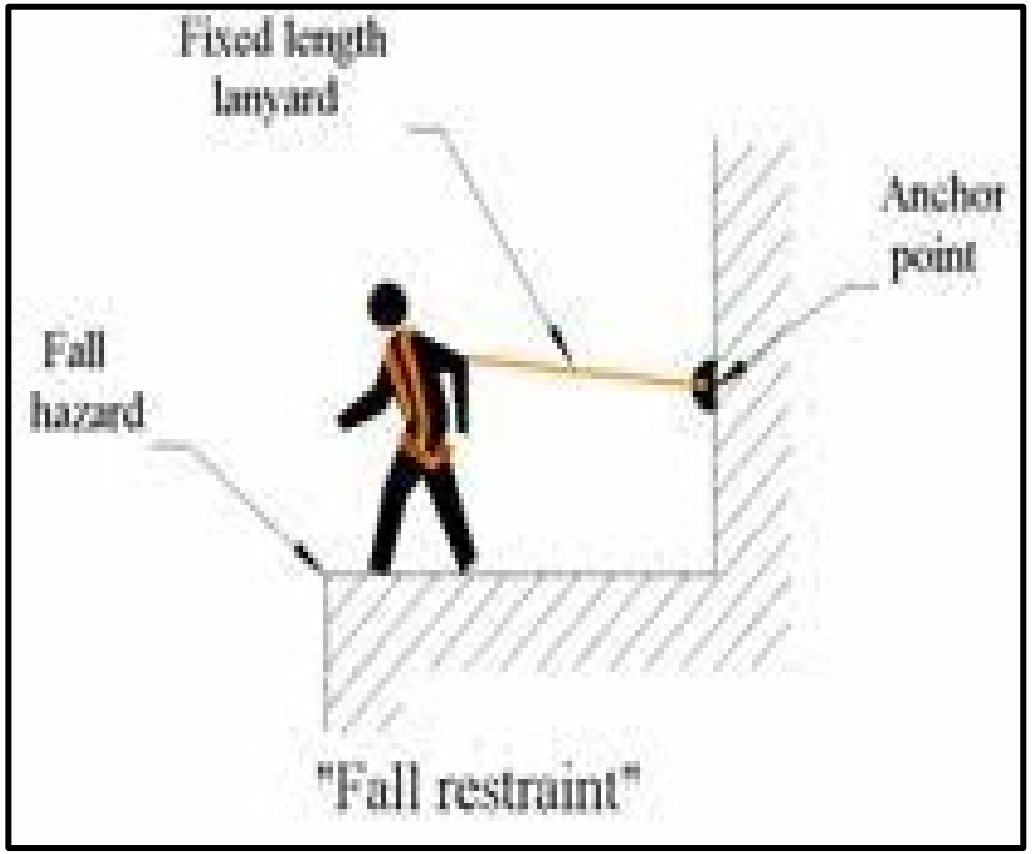
Could you add a gate for easier access?

If so, could attendant remove a chain or open a gate to load materials?

Fall Protection Methods – Guardrails

If you have a gate that is opened for access,

DLS said you would need some type of fall protection system as <u>opening the gate removes the protection</u>.



https://safety.fsu.edu/safety_manual/Fall%20Protection.pdf

Fall Protection – Guardrail Examples

MIIA Grant Funded Railings for FCSWMD

Machine Guarding
OSHA 1910.212

Prevents exposures to moving parts.

Machine Guarding – Note

The types of machine guards used on compactors are not located

<u>at the point of operation</u>!

Machine Guarding – Methods

Two systems:

1. An electrical interlock connection on the compactor door to prevent it from working when the door is open.

Machine Guarding – Methods

Interlock Safety Issues

Attendants must never:

- Bypass or disable the interlock
- Operate the compactor with the doors open as materials can fly out under pressure

Machine Guarding – Methods

2. A guardrail or chain meeting OSHA Guardrail Standard.

Machine Guarding – Attendant

Attendants must:

- Be trained and authorized to operate compactor.
- Not bypass safeguards.
- Not allow residents near the compactor hazard areas.

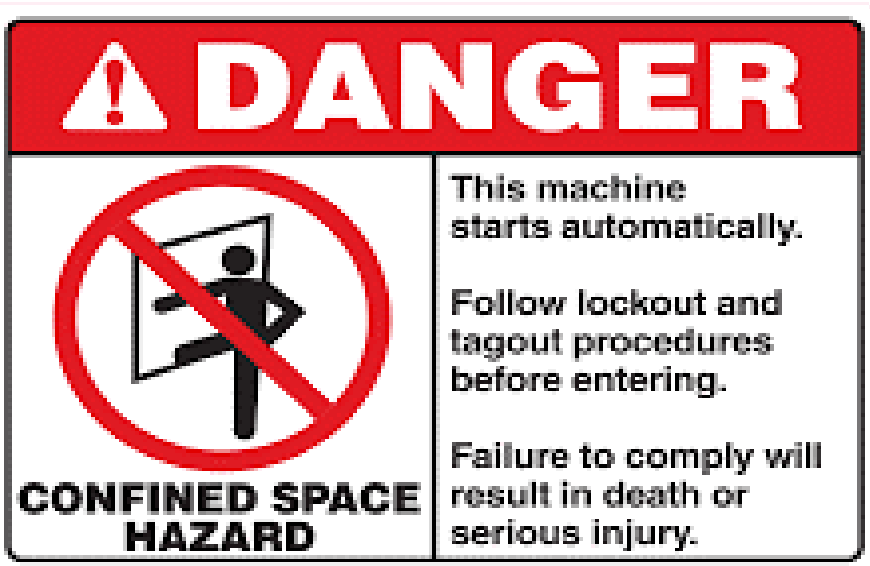
Confined Space

OSHA 1910.146

Confined Space – Definition

A space that is:

- is not necessarily designed for people,
- but is large enough for workers to enter and perform certain jobs.



Confined Space – Protections

It prevents people from being:

"engulfed" or "crushed" by materials, or

"struck-by" or "crushed" by machinery inside the compactor.

Is a Compactor a Confined Space?

Yes, it meets the following criteria:

- ✓ It has limited or restricted means of entry or egress.
- ✓ It is not designed for continuous human occupancy.
- ✓ It is large enough for an employee to enter and perform some types of work.

Is a Compactor a "Permit Required" Confined Space?

Yes, why???
compactors have a
"recognized physical safety hazard"

Thus,

they regulated as a
"Permit Required"
Confined Space
(PRCS).

A Compactor as a PRCS

Recognized physical safety hazards to entrants include:

1. physical injury from entrapment or unguarded machinery, or
2. engulfment by waste.

PRCS

What are the Town's responsibilities?

Town Responsibilities

To serve as the "Host Employer."

Involves:

- Coordinating all PRCS activities on site between town and contractors.
- Approving contractor's work.

Town Role as "Host Employer"

Communicates to the Contractor:

- The compactors are a PRCS.
- The hazards that qualify the compactor as a PRCS.
- The precautions taken to protect employees (e.g., sign posted).

Town Role as "Host Employer"

Communicate to the Contractor:

- Whether municipal employees will be present.
- That entry into the compactor spaces is only allowed through the three options:

  1. a PRCS program,
  2. alternative procedures, or
  3. a space reclassification.

Town Responsibilities To Employees

Even if employees will never enter PRCS, you must notify them of the permit spaces and prohibitions against entering.

This is accomplished by posting a "sign" at or near entry point,

that the space is off limits to all, except authorized personnel.

Town Oversight Responsibilities

You must declare a position as a "Competent Person" to serve as the "PRCS Program Supervisor" to coordinate all PRCS activities.

Qualifications can be acquired by training and/or experience, and must include:

1. Knowledge of applicable standards
2. Able to identify hazards relating to the operation

The Town must authorize them to to correct hazards and stop work if necessary.

Role of the PRCS Supervisor

They are responsible for:

1. Implementing and monitoring compliance with the PRCS program.
2. Coordinating program activities with contractors and Town employees.
3. Ensuring that all hazards are removed.
4. Generating a *Temporary Reclassification Permit* if, and when needed.

What level of a Confined Space Program is needed?

The level is determined by:

- how the compactor is worked on, and
- if that work involves entering the confined space or modifying the confined space before entering.

What level of a Confined Space Program is needed?

3 Options for Working on Compactors:

1. Alternative Procedures for Entry
2. ALL Hazards Can Be Removed Before Entry
3. Hazards Can Be Controlled But Not Eliminated Before Entry

Levels of Confined Space Program

1. Alternative Procedures for Entry

Refers to spaces with an actual or potential hazardous atmosphere as their only hazard.

The scenario at TS for work on compactor that fits this option is when “All Work is Conducted From Outside” (the space's exterior).

- Training is required for personnel conducting the alternative procedures.
- A written PRCS Program is not required.

Levels of Confined Space Program

2. ALL hazards can be removed before entry:

OSHA calls this option "Reclassification."

It is allowed when there are no actual or potential atmospheric hazards, and when other hazards within are eliminated without entry.

- **Entry must not be required to verify elimination of all the hazards.**
- **If entry is needed to eliminate or verify the elimination, then a full PRCS Program is required.**
- **Air Testing is unnecessary in this scenario.**

Levels of Confined Space Program

2. ALL hazards can be removed before entry:

"Reclassification" Requirements:

Warning signs are still required to warn employees.

Posting this sign near the compactor fulfills this requirement.

Levels of Confined Space Program

2. ALL hazards can be removed before entry:

"Reclassification" Requirements:

The PRCS Supervisor must complete a *Reclassification Permit Worksheet* before entry to confirm removal of hazards.

Training is required for contractor personnel using the Reclassifying Permit Procedures.

CONFINED SPACE - TOWN TRANSFER STATION
TEMPORARY RECLASSIFICATION WORKSHEET

Reclassification of the Permit-Required Confined Space (PRCS) is allowed when all hazards can be eliminated without entering the space. There can be no actual or potential atmospheric hazards. OSHA requires that the following information be documented before entry under Reclassification is conducted.

This form is to be completed by the Town's Confined Space Supervisor.

SPACE IDENTIFICATION: _____

TASK: _____

HAZARD ELIMINATION:

	YES	NO	N/A
__ Engulfment: material removed?	___	___	___
__ Electrical: locked and tagged out?	___	___	___
__ Hydraulic: locked out and blocked?	___	___	___

Note: If the answer to any of these questions is no, it cannot be reclassified, and entry is not allowed unless a full PRCS program with a permit is implemented.

ACCEPTABLE AIR LEVELS CONFIRMED – not required for compactors.

PROCEDURE:

__ If hazards arise during entry, evacuate immediately.

__ If hazards arise, use a Full Confined Space Program with a Permit.

Provide this completed worksheet to all entrants and attendants before entry.

_____ _____

Signature of the Town Confined Space Supervisor (Competent Person) Date

Levels of Confined Space Program

3. Hazards can be controlled but not eliminated before entry:

Even after energy sources are locked out or tagged out, a toxic hazard might still be inside the space.

This scenario applies when the contractor works on compactor with the container attached.

Levels of Confined Space Program

3. Hazards can be controlled but not eliminated before entry:

Option 3 Requirements:

Contractor must have a full PRCS program, and:

- Inform the Town of their PRCS program.
- Obtain and document information from Town:
  - hazards of the permit space
  - information from previous entry operations

Levels of Confined Space Program

3. Hazards can be controlled but not eliminated before entry:

Note: A written PRCS Program is different than an entry permit:

- Written Program – a guidance document for employers with procedures required for safe entry into a permit space.
- Entry Permit – a checklist of required tasks that ensures all the steps for safe entry have been taken prior to entry.

Option 3 – Contractor Requirements, Continued

- Generate entry permits from their PRCS program that identifies and addresses PRCS hazards.
- Inform Town when they will be working inside the PRCS.
- Debrief with Town during (if needed), or at end of entry operations regarding any hazards found or created during entry operations.

Note: A full PRCS is not covered in the MIIA OSHA Program for TS.

Resources for a Full PRCS Program

Contact the Department of Labor Standards:

- PRCS Template on DLS website: https://www.mass.gov/doc/confined-space-construction-program-plan-template/download
- For questions about the applicability of a full PCRS Plan, contact DLS technical assistance at:
  - Phone: (508) 616-0461 ext. 9488
  - Email: safepublicworkplacemailbox@mass.gov

Lock-Out/Tag-Out (LO/TO)

1910.147: The control of hazardous energy

The Purpose of LO/TO Program

The LO/TO Program provides procedures to protect employees and contractors during servicing of the compactor from:

- the unexpected energization or startup of the compactor, or
- the release of hazardous energy.

LO/TO Applies When……

Whenever activities could release stored energy.

Always before servicing!

NIOSH says when clearing jams.

LO/TO Applies When……

Check with the compactor manufacturer to determine when LO/TO is required on your equipment.

RamJet® Stationary Compactor 35
Service

LOCK-OUT & TAG-OUT INSTRUCTIONS

⚠ DANGER

Before entering any part of the compactor, be sure that all sources of energy have been shut off, all potential hazards have been eliminated, and the compactor is locked-out and tagged-out in accordance with OSHA and ANSI requirements.

The specific Lock-Out and Tag-Out instructions may vary from company to company (i.e. multiple locks may be required, or other machinery may need to be locked-out and tagged-out). The following instructions are provided as minimum guidelines.

How does a LO/TO Program protect employees and contractors?

A LO/TO Program provides:

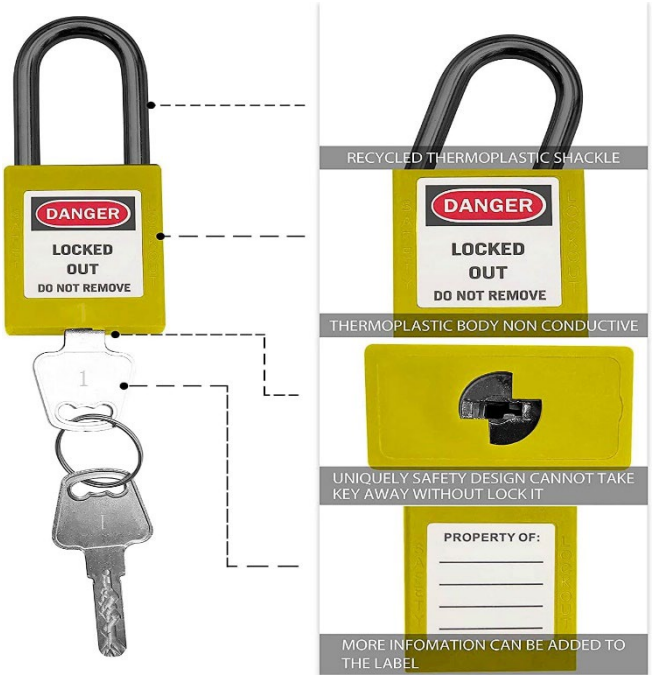
- training
- notification procedures
- procedures and equipment to physically isolate stored energy from the equipment

How does the LO/TO Program protect employees and contractors?

It provides a LO/TO system:

1) Locks:

- Used to immobilize energy sources from being operated.
- Have specific requirements.



How does the LO/TO Program protect employees and contractors?

2) Tags – to warn:

DANGER

DO NOT OPERATE

The Energy Source Has Been Locked Out

The following guidance is based on the premise that work on compactors requiring de-energization is contracted out.

If LO/TO services are provided by municipal employees, then additional training and a full written LO/TO program is required.

If you have questions about the applicability of a LO/TO Program, contact DLS technical assistance at:

Phone: (508) 616-0461 ext. 9488
Email: safepublicworkplacemailbox@mass.gov

See DLS LO/TO Template for DPWs:
https://www.mass.gov/doc/lockout-tagout-sample-plan

How to determine if you need a full LO/TO Program?

First… consider whether you be able to contract out all LO/TO work when necessary?

Check with the operating manual or manufacturer to determine which activities require LO/TO.

How to determine if you need a full LO/TO Program?

Determine if you have the capacity to implement a full LO/TO program by:

- Developing and implementing LO/TO procedures.
- Annually evaluating procedures and program.

How to determine if you need a full LO/TO Program?

Determine if you have capacity for:

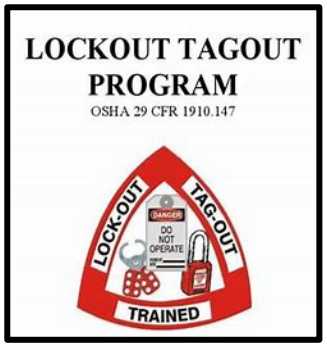
Training and supervising "authorized" employees on:

- the specific LO/TO procedures for your equipment
- responsibilities for lock and tag installation and removal, including during shift changes

Ok – Let's Dive In!

OSHA LO/TO Program responsibilities when the Town uses a contractor!

LO/TO Requirements



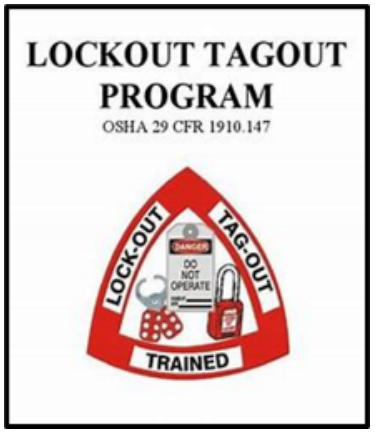
Both Town and Contractor must have a "Written LO/TO Program".

It specifies the roles and responsibilities (R&R) of the Town and Contractor.

MIIA provides:

1. A modified *LO/TO Program Template* for towns that contract work out.
2. A memo to send to contractors re: R&R.

Elements of the LO/TO Program



1. Assigned roles and responsibilities
2. Documentation of equipment requiring LO/TO and their energy sources
3. Written LO/TO procedures for each piece of equipment

Elements of the LOTO Program, Continued

5. Identified power isolation points
6. Training per assigned roles
7. Annual auditing of LO/TO procedures

Elements of LO/TO Program

Example of Compactors Requiring LO/TO

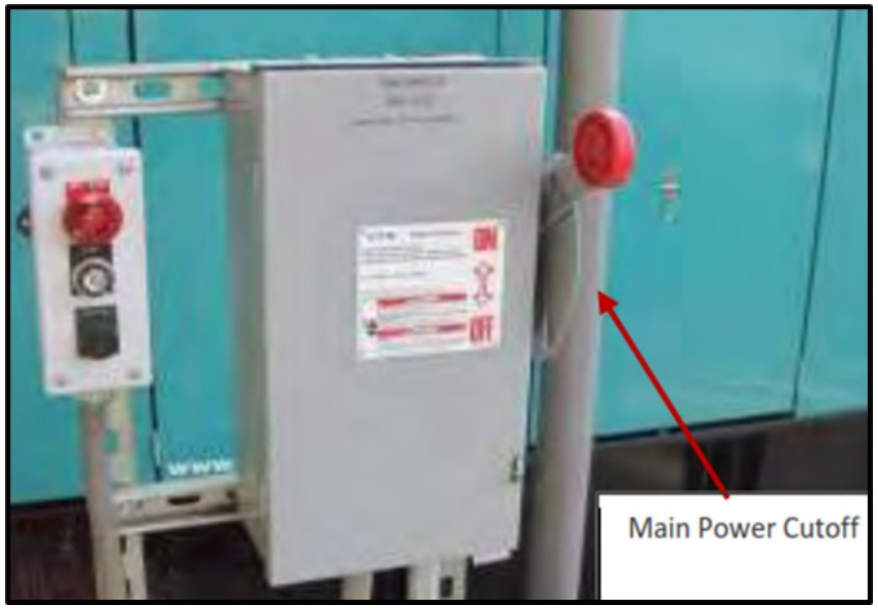
List equipment name, model, serial number, and location of equipment and energy source.

Equipment Name	Model #	Serial #	Location of Equipment	Energy Source	Site of Disconnect
Trash Compactor	E-Z Pack UTS-1	1-111-0	Transfer Station Building	Electric Power to Hydraulic Ram.	▪ East Side of Compactor ▪ Operators Office
Corrugated #1	Marathon	225 VI 70558	Recycle Area Bay 1	Electric Power to Hydraulic Ram.	At End of Compactor Unit
Comingle #1	NONE LISTED		Recycle Area Bay 2	Electric Power to Hydraulic Ram.	At End of Compactor Unit
Corrugated #2	Peabody/Galion 47FPLC6	E3043C	Recycle Area Bay 3	Electric Power to Hydraulic Ram.	At End of Compactor Unit
Comingle #2	NONE LISTED		Recycle Area Bay 4	Electric Power to Hydraulic Ram.	At End of Compactor Unit

Elements of LO/TO Program

Identify and label each compactor's:

Power disconnects (energy isolating device) that prevent transmission or release of energy:



Elements of LOTO Program

Provide a LO/TO procedure for each compactor.

Appendix # 1 - Trash Compactor Energy Control Procedure (LOTO)

Trash Compactor Energy Control Procedure (LOTO)		
Machine/equipment	Trash Compactor @ Transfer Station Building	
Equipment Identification	Model # E-Z Pack UTS-1 Serial # 1-111-0	
Operator Controls	Control panel	
Energy Sources: ☒ **Electrical** ☐ **Steam** ☐ **Pneumatic** ☐ **Other** ☐ **Natural Gas** ☒ **Hydraulic** ☒ **Stored Energy Source** – Hydraulic / Mechanical Energy		
Identify Energy Source/location Electrical / Operator Office + East side of compactor Hydraulic (lube system)	**Lockable** Yes No	**Type Device Required** Padlock De-energized when power off Padlock
Shutdown Procedures:		
1. Notify all affected employees of lockout 2. Turn Control Panel Keys to Off Positions and remove Keys 3. Lock Out Electrical Panel Switch in Main Office to Off Position	4. Place tag on switch indicating lockout 5. Lock Out Pump Motor Switch On east face of Compactor 6. Place tag on switch indicating lockout 7. Read all hydraulic gauges to ensure there is no stored hydraulic pressure.	
Lock Type & Procedure: _ Electrical – pull throw switch to off position, insert lock and tag.		
De-energized & Verified (How): _ Electrical - Attempt to start press by activating start button. _ Hydraulic - Verify all pressure gauges read "zero".		
Startup Procedure		
1. Remove all tools and materials from area. 2. Replace all covers and guarding devices 3. Check that all personnel are in a safe area out from any hazards	4. Restore energy sources 5. Restart equipment and verify operation 6. Notify all affected employees	

Program Implementation

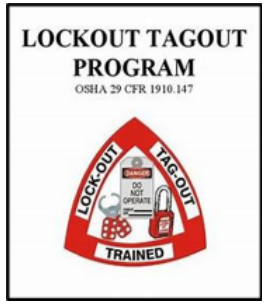
Working With Contractors

The Town is considered the

"On-Site" Employer

Working With Contractors

Require them to comply with OSHA by having:



- A LO/TO program
- "Authorized" technicians who:

  - Are trained to do the LOTO procedure.
  - Have their own locks and tags

Working With Contractors

Per OSHA, they must also:

- Conduct accident investigations involving LO/TO accidents.
- Conduct inspections of their LO/TO procedure at least annually.
- Evaluate their LO/TO program annually.

Communicating With Contractors

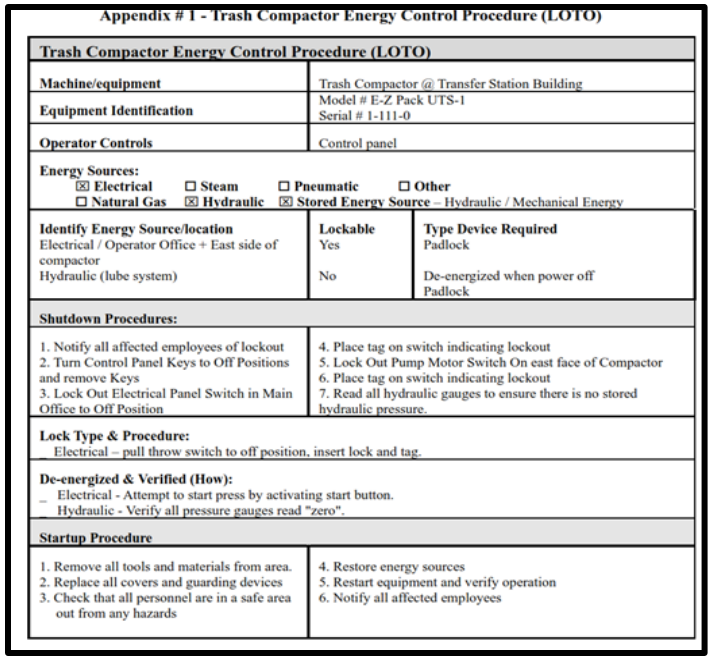
1910.147(f)(2) and 1910.147(f)(2)(i)

Whenever "outside servicing personnel" (contractors) are engaged in activities covered by this standard,

the on-site employer (Town) and the outside employer (contractor) shall inform each other of their respective lockout or tagout procedures.

Communicating With Contractors

- Provide contractor with specific compactor LO/TO procedures.



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Startup Procedure		
1. Remove all tools and materials from area. 2. Replace all covers and guarding devices 3. Check that all personnel are in a safe area out from any hazards	4. Restore energy sources 5. Restart equipment and verify operation 6. Notify all affected employees	

- The name of the town supervisor of the LOTO program.

Communicating With Contractors

Provide location of all control devices, which must be:

1. listed in the LOTO procedures
2. identified on the site layout
3. labeled on-site

Contractor Communication Requirements

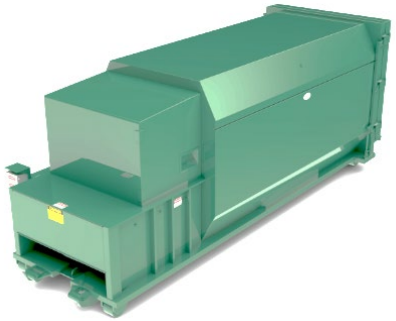
The contractor will communicate when:

- LO/TO activities begin and end.
- There is a problem with the LO/TO protocol or the compactor.
- Work is complete, locks and tags removed, compactor is safe for use.

Contractor LO/TO Documentation

Options include either an email or note in the invoice from the contractor at the completion of work:

- Type of work completed



- Compactor(s) worked on
- Date work started and ended

# Town Communication Requirements
1910.147(f)(2)(ii)

To Employees

The on-site employer (Town) shall ensure that:

town employees understand and comply with the restrictions and prohibitions (e.g., locks, tags) of the contractor's LO/TO program.

Town Responsibilities: Employees

Provide:

- Employee notification and supervision when LO/TO activities are underway in their work area and on their equipment:
  - Before controls are applied
  - When LO/TO devices are applied and removed
- Training for "Affected" and "Other" employees.

Employee Training Content

- Content is based on worker categories.
- Must retrain when there is a change in:
  - LO/TO program
  - job assignment
  - equipment or processes
  - energy control procedure
- Must also retrain when performance warrants it!

Worker Categories & Training Requirements

Position	Target Audience	Content
"Authorized" employees are those who perform LO/TO.	The contractor's employees conducting LO/TO	• How to do LO/TO.
"Affected" employees are those who operate the equipment being LO/TO, but do not participate in LO/TO.	Transfer station attendants	• Purpose of the LOTO program. • Purpose and recognition of the LO/TO procedure. • Prohibition of attempting to restart the compactor that is LO/TO.
"Other" employees are those whose may be in areas where LO/TO is being used.	Transfer station supervisor or another Town employee	

Attendant Role

- Notify supervisor when compactors need service/repair.
- Understand what the LO/TO devices and tags mean.

- Leave all LO/TO devices in place.
- Await instructions before using equipment that was LO/TO.
- Follow all safety rules while operating compactor.

Provide Attendants with Tools and Guidance

Provide Tools:
To Move Items Inside the Hopper

There are 2 different size picker/grabber tools with slightly different features:

1. An extendable “Grabber Reacher”, which is a trash picker that extends from 30" to 44".

2. A 96” full length trash picker to reach into below grade compactor openings.

Provide the Attendant Guidance

- When moving items inside the hopper
- When or clearing a jam
- When retrieving a dropped item
- What to do if there is a fire

Provide Guidance for Responding to a Fire in the Compactor

Compactor Inspection

- Types:
  - Self inspections (use equipment manual)
  - Vendor inspections
- Provide Criteria – examples:
  - Safety and control mechanisms
  - Labels identifying shut-offs
  - Safety signage
  - Areas around the compactor for debris
  - Connections

Compactor Maintenance

- Determine which tasks require LO/TO.
- Determine which tasks employees will do versus a contractor.
- Obtain a quote from contractor.
- Schedule maintenance.