



Mississippi State Fire Academy

Trench Rescue Technician Level Skill

Objective: NFPA 1006 11.3.3 & 11.3.4
2017 Ed.

Primary Task: Lift and stabilize a load in a trench rescue incident

Performance Steps

1. Lift a load given a trench rescue tool kit the required distance to gain access
2. Settling or dropping of the load is prevented
3. Control and stabilization are maintained before, during, and after the lift
4. Operational objectives are attained
5. Construct load stabilization systems, given a load assignment, PPE, and a trench tool kit
6. The stabilization system will support the load safely
7. The system is stable
8. The assignment is completed

INSTRUCTIONS TO THE CANDIDATE

The candidate, given equipment likely to be used in a trench rescue, a trench, or trench prop, shall explain and / or demonstrate how to properly lift and stabilize a heavy load in a trench environment. They shall make all appropriate air cart, regulator, hose, controller, and lift bag connections. Load weight shall be calculated. Lift bag capacity shall be calculated. Stacking & lift sequence explained. Various pressures on low pressure bags, medium cushions, and high pressure air bags are stated and explained. Different use of each air bag type explained. Candidate shall calculate weight of dirt and concrete. Lifting shall be accompanied by appropriate shoring operation. Various shoring and stabilization options can be used including: cribbing, chains, ratchets, wedges, shims, and other rescue adjuncts.

Air Cart / Regulator Operation

Full Points- (all must apply)

- All valves and regulators are checked and verified prior to operation
- Correct high pressure cylinder valve is turned on
- Orients Selection valve to correct bottle
- Ensures all valves are closed
- Makes appropriate hose connections and locks collars in place
- Chooses correct / appropriate: tool, deadman controller, or other adjunct for operation
- Selects *high pressure* side of the cart and explains why
- Adjusts regulator to the correct pressure for job application (explains why)
- Opens valve to desired hose(s)

Connections / Hook-up

Full Points- (all must apply)

- Connections= Cart-Hose-Controller-Hose-Air Bag / Cushion
- or
- Connections=SCBA Cylinder-Bottle Regulator-Hose-Controller-Hose-Air Bag / Cushion
- or
- Connection= Air source-Regulator Source-High pressure hose-Low or medium pressure manifold-
- Connections are made prior to pressurization
- Hose collars are securely connected with threaded lock

Various Bag Pressures and Uses

Full Points- (all must apply)

- States or demonstrates regulating: 118(120) PSI for High Pressure Air Bags **New Paratech allows
- States or demonstrates regulating: 7 PSI for Low Pressure Trench Cushions
- States or demonstrates regulating: 14 PSI for Medium Pressure Lift Cushions (22 in text)
- States or demonstrates regulating: 90 PSI for shop tools: palm nailer, nail gun, impact wrench

Load Calculation

Full Points- (all must apply)

- Candidate explains where to find lifting capacity of air bags / cushions
- Candidate explains and demonstrates field calculation of air bag lift capacity (L x W x PSI)
- Calculates weight of dry soil between 60-80 lbs per cubic ft
- Calculates weight of wet soil up to 150 lbs per cubic ft
- Calculates average weight of soil as 100 lbs per cubic ft
- Calculates average weight of steel-reinforced concrete at 150 lbs per cubic ft
- Calculates anticipated load (L x W x H) x (conversion factor) *within 10% of correct weight
- Calculates anticipated load [$\pi \times r^2$] (Outside diameter-Inside diameter) x Length x Conversion

Shoring and Stabilization

Full Points- (all must apply)

- Load is (cribbed / stabilized / shored) with the lift (inch by inch)
- Capacity of cribbing is calculated (4"x4"= 6000 lbs per point) (6" x 6"=15,000 lbs per point)
- Overlap in crib members is equal or greater than dimension (4" or 6")
- Crib tower is clean, symmetrical, load travels through continuous load column
- Crib tower height is less than 3x the length of crib base

Bag Stacking

Full Points- (all must apply)

- No more than two high pressure bags are stacked
- The larger capacity bag is placed on the bottom
- The larger capacity bag is inflated first to make contact
- The smaller capacity bag is inflated for the lift
- Additional lift of larger capacity bag used if needed

Demobilize Air Bags / Regulators / Air Cart

Full Points / All Must Apply Either- (Method 1 or 2)

- Method 1:
 - Turn high pressure cylinder off
 - Turn Down / Bleed Down Regulators & Lines
 - Release / Discharge remaining air through deadman (Red & Green buttons at same
- Method 2:
 - Turn Down / Bleed Down Regulators & Lines
 - Release / Discharge remaining air through deadman (Red & Green buttons at same
 - Turn off valves to air line(s)
 - Turn high pressure cylinder off
 - Open Up / Release Air: by turning valve open above the regulator block

Safety / PPE Evaluation Criteria:

Full Points- (all must apply)

- Candidate utilizes appropriate PPE: Protective toe boots, helmet, gloves, eye protection, ear
- Candidate demonstrates a system safety check before testing or operating system;
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- Candidate demonstrates a system safety check before testing or operating system;
- Candidate does not place body or extremities under unsecured load [while cribbing (hand

Time Evaluation Criteria:

Full Points- (all must apply)

- Under 6 minutes.