



New Mexico Tech

NEW MEXICO BUREAU OF MINE SAFETY

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Guest Article

Melissa J. Barker is a Compliance Assistance Specialist with the New Mexico Occupational Health and Safety Bureau (NM OSHA). Ms. Barker began her career in occupational health and safety as a summer intern with the Bureau, which led to a permanent position as a Health and Safety Compliance Officer. After leaving NM OSHA for the private sector, she returned to the Bureau nearly four years ago to serve in her current role of working cooperatively with industry to improve the health and safety of NM workers. Here is her article on excavation safety.



Excavation Safety in Construction

The trench collapse that recently killed two Las Vegas, NM city workers is a tragic reminder of the hazards associated with unprotected trenches and excavations. Excavating is recognized as one of the most hazardous construction activities. The primary concern in excavation-related work is a cave-in. Cave-ins are much more likely to be fatal to the employees involved than other construction-related accidents.

Excavation Safety Overview

Planning Work

Consider the following when pre-planning work:

- Call before you dig – 811
- Complete a Job Hazard Analysis (JHA)
- Ensure sufficient personnel are available and trained to safely perform the work
- Assess the need for, and provide, adequate equipment and materials
- Address site layout conditions including, but not limited to; traffic, overhead power lines, housekeeping, other trades, surface encumbrances, adjacent structure stability, hazardous atmospheres, weather

Plan for emergencies including emergency rescue equipment when working in hazardous atmospheres

Competent Person

Designated by the employer, a competent person must possess the training, experience and authority to carry out the responsibilities of their role. A competent person is required when performing excavation work.

The Weight of Soil

The weight of soil varies with type and moisture content. One cubic foot of soil can weigh from 110 pounds to 140 pounds or more, and one cubic meter of soil can weigh more than 3,000 pounds.

Soil Mechanics

There are a number of stresses and deformations that can occur in an open cut or trench. Some of the more frequently identified causes of trench failure include, tension cracks; sliding; toppling; subsidence and bulging; heaving or squeezing, and boiling.

Soil Types

OSHA categorizes soil and rock deposits into four types (below). Visual and manual tests are two methods that may be used for evaluating soil types.

Stable Rock

Type A Soils includes cohesive soils such as clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam

Type B Soils examples include angular gravel; silt; and silt loam

Type C Soils include granular soils such as gravel, sand and loamy sand, submerged soil, soil from which water is freely seeping, and submerged rock that is not stable

Note: Layered Geological Strata is when soils are configured in layers. In this case, the soil must be



classified on the basis of the soil classification of the weakest soil layer.

Protective Systems

Protective systems are required in excavations to protect workers. Protective systems include **sloping, benching, shoring** and **shielding**. The methods used depend on factors such as soil type and water content, excavation depth and width, the nature of the work and other risks that could increase the risk of cave-in.

Inspections

Daily inspections of excavations, the adjacent areas, and protective systems are required to be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. Inspections are required by a competent person prior to the start of work and as needed throughout the shift and after every rainstorm or any other hazard increasing occurrence.

Excavation Safety by the Numbers

2	Excavated materials and equipment 2' from edge of excavation, or retaining devices used
	2' maximum excavating below bottom of protective devices and only under certain safe conditions
4	Atmospheric testing in excavations > 4' where O2 deficiency or hazardous atmosphere exists or could exist
	Safe means of access/egress in excavations 4' or deeper, with no more than 25' lateral travel
5	Protective systems required >5', and <5' when potential for cave-in
6	If crossing over excavations, walkways & guardrails above 6' height
18	Support/shield systems must extend 18" above top of vertical side
20	Ventilation to prevent atmospheres containing flammable gas > 20% of LFL
	Sloping/benching deeper than 20' must be engineer-designed

29 CFR 1926, Subpart P-Excavations, includes OSHA's regulatory requirements for excavations in construction. Excavations are defined to include



trenches. There are specific requirements for underground construction and underground lines in 29 CFR 1926.800 and 1926.956. Additional information, including specific OSHA regulations, may be located at:

www.osha.gov .

Injuries at Aggregate Operations

A good safety flyer is available on the MSHA web site dealing with recent injuries at aggregate operations.

<http://www.msha.gov/Alliances/Formatted/NSSGA/AggregateInjuries072011.pdf>



One area of recent concern is two fatalities that have occurred due to failure to lock out/tag out (LOTO). Both involved employees standing on a beltline performing maintenance when the belt was started. The latest of these occurred in February at a Utah aggregate operation. The investigation report is available at:

<http://www.msha.gov/FATALS/2011/FTL11m03.asp>

This is a good opportunity to review LOTO procedures with your employees. Also remember that **all employees** performing any type of cleaning or maintenance work on stockpiles, conveyors, crushers or screens **must be** task trained in the work to be performed.

Contractor's Training

Last month's guest column on contractor's training raised a few questions that we would like to make sure are clarified.

1. A contractor working on a mine requiring either Part 46 or 48 training **must** have their own MSHA approved training plan.
2. Contractors working at both Part 46 & 48 mines may train for both using their own MSHA approved Part 48 training plan.



3. Contractors working at both Part 46 & 48 mines would be prudent to include the safety elements of both in their Part 48 training plan.

Training

The current Training Schedule through September can be found on our web site:

<http://www.bmi.state.nm.us/navTrng.htm>

Please take time to look it over. To schedule a class, please call Chris at (505) 553-1535.

BMS New Employee

Please join me in welcoming Jacoby Boles to the Bureau of Mine Safety. Jacoby joined us in June as our Administrative Specialist. Jacoby brings much needed expertise in electronic media to BMS and is currently revamping our web site. He has a BA in Liberal Arts and is working on his BS in Management at NMT.

Jacoby's mining interest is in part related to his father, a former NM uranium miner. Visit our web site and see Jacoby's work!



SMI Reappointment

Over the past 6 months many of you have been asking if I still have a job. Well thanks to many of your efforts, I have been reappointed for another term as the SMI by Governor Martinez. Secretary of State Duran gave me my oath of office on July 11th. Senate confirmation looms for the next legislative session. Many thanks for your help and I hope to serve you well.



Mine Health and Safety is



In New Mexico!