

Site Excavation- Forfending the Safety Hazards Caused by a Backhoe

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Presentation Outline

- Introduction
 - Soil and its Classifications
 - Excavation and Hazards around it
- Heavy Equipment Hazards
- What is a Backhoe and why do we care?
- Controlling and Monitoring the Hazard
 - Engineering Control
 - Administrative Control



Soil and its Classifications

- Solid Rock - Most Stable (Practically Unachievable in the excavation of a trench)
- Type A – Clay, Silty Clay or Sandy Clay
- Type B – If vibrations can be felt standing next to the excavation it can be considered Type B or C
- Type C - Least Stable



Excavation and Hazards Around it

- OSHA defines an excavation as any man-made cut, cavity, trench, or depression in the earth's surface as formed by earth removal.
- A trench refers to a narrow excavation made below the surface of the ground in which the depth is greater than the width-and the width does not exceed 15 feet.
- The most common type of hazard when working in excavation and trenches is the threat of cave-in. It occurs when the walls of the excavation collapse.
- Excavation-related heavy equipment, such as backhoes, and other vehicles accounted for 11% of trench-related deaths, about 6 deaths per year. Injury source being construction heavy equipment (53%) and trucks (26%).

Excavation and Hazards Around it Contd..

Causes of death in the excavation industry, 1992–2002

Cause of death	Total deaths		Vehicle-related deaths on construction site	
	No.	%	No.	%
Moving vehicle incidents ¹	224	46%	134	53%
Struck by objects	76	16%	60	24%
Excavation or trenching cave-in	76	16%	–	–
Caught in/between	35	7%	31	12%
Other ²	70	15%	26	10%
Total	481	100%	253	³



Heavy Equipment Hazards

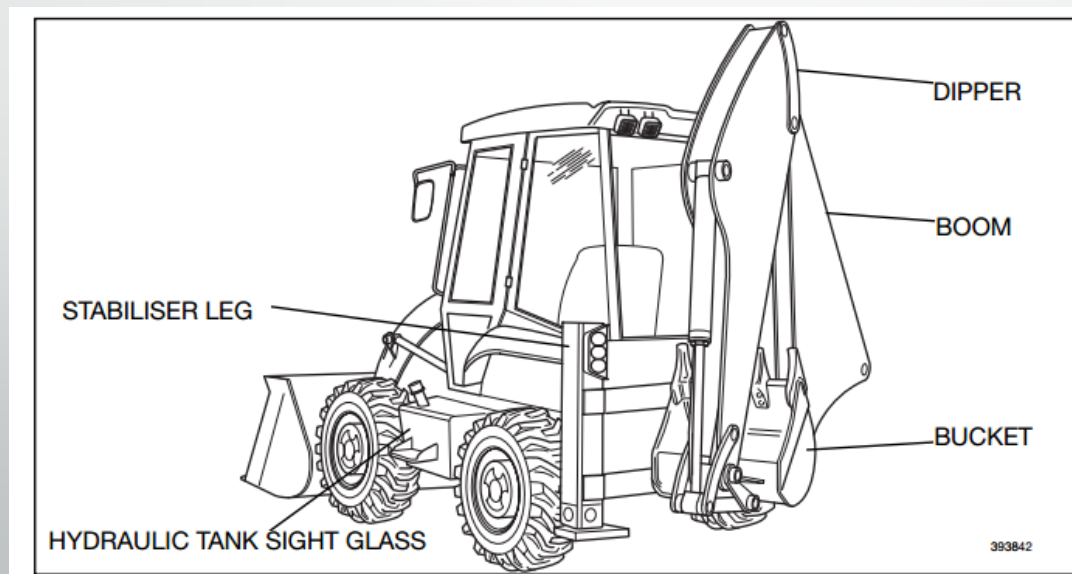
- Construction sites are generally defined as structured spaces consisting of multiple resources such as personnel, equipment, and materials that are involved in dynamic work tasks and these resources are often in motion and come in close proximity to each other.
- Construction workers operate and interact with various heavy equipment like bulldozers, back hoes, concrete mixers, which can cause injury to the operator, nearby co-workers or the general public if the proper precautions are not followed.
- Vehicles and mobile heavy equipment are a chief source of fatalities in construction that has resulted in 7,681 deaths from 1992 to 2010, about 404 deaths annually.

Heavy Equipment Hazards Contd..

- Causes of deaths are categorized as
 - “struck by” a vehicle/mobile equipment,
 - “caught in/between” (such as a worker caught between parts of a dump truck).
 - “struck by object” (such as by a vehicle part).

What is a Backhoe and why do we care?

- A backhoe, also called a rear actor or back actor, is a piece of excavating equipment or digger consisting of a digging bucket on the end of a two-part articulated arm.



What is a Backhoe and why do we care? Contd..

Types of vehicles involved in heavy equipment and truck-related deaths in excavation work, 1992–2002

Vehicle type	Rollover	Struck by vehicle	Struck by objects	Caught in/ between	Other	Total	%
Trucks ¹	5	34	8	11	6	64	25%
Backhoes/ other excavating machinery ²	9	13	26	6	9	63	25%
Bulldozers	18	11	7	–	8	45	18%
Loaders ³	10	–	8	6	–	28	11%
Road grading and surfacing machinery ⁴	7	10	–	–	–	21	8%
Tractors	6	–	–	–	–	14	6%
Other ⁵	–	–	10	–	–	18	7%
Total	57	76	61	31	28	253	100%

Controlling and Monitoring the Hazard

- Engineering Control
 - General Safety
 - Operating Safety
 - Maintenance Safety
- Administrative Control
 - Setting up the Site
 - Workers Safety Recommendation
 - Equipment Operators



How training and preparedness can save a life..





Thank You!

Comments/Questions?