

**Suffolk County Fire Academy**

*Trench Rescue Operations  
Session 2*




Suffolk County  
Fire Academy

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**Course Overview**

📌 **Session 2**

- **Trench Operations**
  - **Preparation - Incident Termination**
- **Your Team**
- **Student Exercise**
- **Final Exam**
- **Trench Victim Scenario.**



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**Course Objectives**

- 📌 **Conduct a size-up of a trench excavation to identify the potential hazards to victims and rescuers (NFPA 1006 12.2.1)**
- 📌 **Implement a hazard control plan (NFPA 1006 12.2.2)**
- 📌 **Develop a shoring plan for a nonintersecting trench ≤ 8' deep (NFPA 1006 12.2.3)**
- 📌 **Implement a trench shoring plan for a nonintersecting trench ≤ 8' deep (NFPA 1006 12.2.4).**



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### Course Objectives

- 🚒 Release a victim from soil entrapment in a nonintersecting collapsed trench ≤ 8' deep (NFPA 1006 12.2.5)
- 🚒 Remove a victim from a trench (NFPA 1006 12.2.6)
- 🚒 Disassemble support systems at a trench emergency incident (NFPA 1006 12.2.7)
- 🚒 Terminate a technical rescue operation (NFPA 1006 12.2.8)



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### Operations At Trench Rescue Incidents

🚒 Preparation



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🚒 In what situations do trench rescue incidents occur?

🚒 Good trench rescue operations are characterized by what elements?



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# Trench Rules

-  > 4' - A Ladder Must Be Used
-  > 5' - The Trench Must Be Shored
-  ≥ 4' - Must Have A Stairway, Ladder, or Ramp Every 25' of Lateral Travel
-  Ladder Must Be Secured and 3' Above The Lip of the Trench.



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-  Padd
-  Movin
-  Shut-



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# Surface Encumbrance

- Trees, Boulders, Etc. Must Be Removed or Supported
- Underground Feature Protection Organization (UFPO) – 1-800-962-7962
  - A.K.A. Dig Safe in New York
  - Mark out utilities
  - Done prior to beginning work.



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# UFPO Markings

Colored Flags Are Used To Mark Location



- |                       |               |
|-----------------------|---------------|
| <b>Electric</b>       | <b>Red</b>    |
| <b>Gas</b>            | <b>Yellow</b> |
| <b>Communications</b> | <b>Orange</b> |
| <b>Water</b>          | <b>Blue</b>   |
| <b>Sewer</b>          | <b>Green</b>  |



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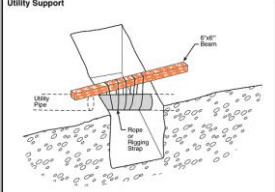
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# Hazard Control

- Two Types of Hazards:**
  - Those you can control
    - Location of vehicles
    - Trip hazards
    - Spoil pile
    - Utility support
  - Those you should leave
    - Gas
    - Electric.



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### Hazard Categories

- Mechanical
- Chemical
- Man-Made
- Electrical
- Water.



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### Hazard Control Phases

- The Rescue Area
- The General Area.



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### Underground Hazards (Lock-Out / Tag-Out)



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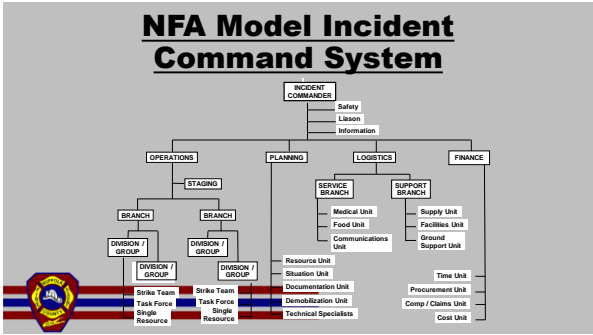
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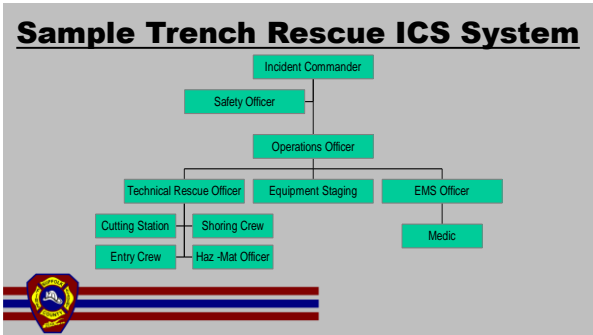
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### First To Arrive

- Keep Apparatus At Least 100' Away
- Establish A Command Post
- Secure Civilian Equipment
- Make Victim Contact
- Address Utilities
- Set-up Zones
- Prepare For The Arrival of Special Equipment.



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### Operations At Trench Rescue Incidents

- Preparation
- Initial Response
- Assessment and Planning.



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### Initial Size-Up

- Who is in command?
- What happened?  
Why were they digging?
- How many victims?
- Where are they buried?  
What type of soil?



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### Initial Size-Up (Cont'd)

- Hazards
- Types of Injuries
- Rescue Vs. Recovery
- Cave-in or Entrapment.



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# Operations At Trench Rescue Incidents

- 🚒 Preparation
- 🚒 Initial Response
- 🚒 Assessment and Planning
- 🚒 Develop an Incident Action Plan (IAP).



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# Establish Zones

- 🚒 **To Protect:**
  - Rescuers
  - Victim(s)
  - Civilians.



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# Rescue Zones

- Hot Zone**                      **Rescue Personnel Only**
- Warm Zone**                    **Command Post, Equipment, Supplies**
- Cold Zone**                    **Media, Support, Rehab**



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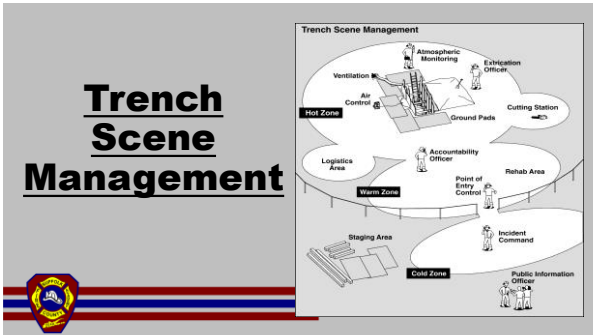
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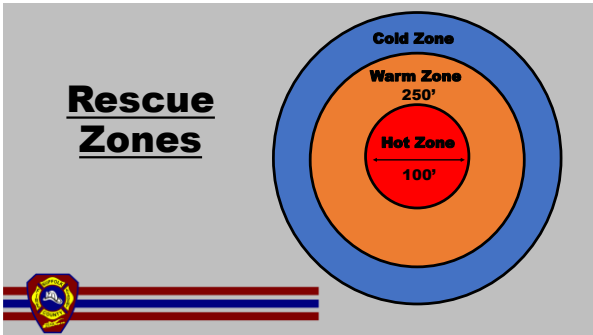
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### IAP Components

- Establish "Rescue Zones"
- Risk/Benefit Analysis
- Safety
- Strategy and Tactics
- Tasks
- RIT
- Hazard Mitigation
- Resources
- Protective Systems.



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### Operations At Trench Rescue Incidents

- Preparation
- Initial Response
- Assessment and Planning
- Develop an Incident Action Plan (IAP)
- Gaining Access.



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### Gaining Access



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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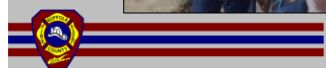
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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



Timber Hitch



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### Gaining Access

*Placing Panels and Struts*



Duplex Nail Bent Over



Middle Strut First  
M.T.B.



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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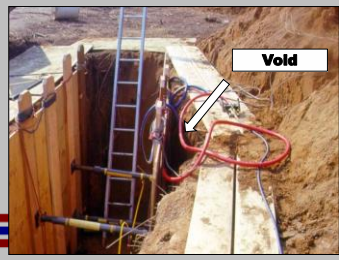
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### Gaining Access

*Placing Panels and Struts*



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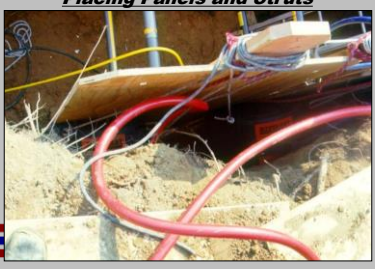
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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Gaining Access

*Placing Panels and Struts*



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### Timber Framing



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### Timber Framing



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# Operations At Trench Rescue Incidents

- ❑ Preparation
- ❑ Initial Response
- ❑ Assessment and Planning
- ❑ Develop an Incident Action Plan (IAP)
- ❑ Gaining Access
- ❑ Disentanglement.



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# Entrapping Mechanisms

- ❑ Dirt
- ❑ Sand
- ❑ Pinned By Pipe
- ❑ Heavy Equipment
- ❑ Miscellaneous.



Shoring?



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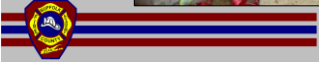
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# Entrapping Mechanisms



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### Digging Out



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### Magnitude of Problem

- ❗ Most Soil Removal Will Be Done By Hand
- ❗ May Be In Excess of 20 - 30 Tons!
- ❗ Never Use A Backhoe or Excavator To Gain Access.



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### Free The Victim Completely



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### Free The Victim Completely

- ⚠ Never attempt to pull a partially buried victim out (even if its just a buried limb - i.e. leg).
- ⚠ Dig by hand and use caution when getting close to victim with any type of entrenching tool.
- ⚠ Do not use heavy, digging equipment.
- ⚠ Consider Vac-Truck for soil removal.



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### Operations At Trench Rescue Incidents

- ⚠ Preparation
- ⚠ Initial Response
- ⚠ Assessment and Planning
- ⚠ Develop an Incident Action Plan (IAP)
- ⚠ Gaining Access
- ⚠ Disentanglement
- ⚠ Victim Packaging and Removal.



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### Packaging And Removal

- 🚒 Plan System With Removal In Mind
- 🚒 Plan Not To Dislodge Shoring
- 🚒 Plan Ahead
- 🚒 Plan Movement Patterns
- 🚒 Plan For Packaging Device.



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### Packaging And Removal



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# Operations At Trench Rescue Incidents

- Preparation
- Initial Response
- Assessment and Planning
- Develop an Incident Action Plan (IAP)
- Gaining Access
- Disentanglement
- Victim Packaging and Removal
- Incident Termination.




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# Equipment Removal



Should Be As Systematic and Deligent As The Install.

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# Equipment Removal



Now Is Not The Time To Get Hurt!

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# Equipment Removal



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# Your Team

- ✔ Success Is In The Members Of The Team
- ✔ Should Be Physically and Mentally Prepared
- ✔ Have Good Construction Skills
- ✔ Team Should Include Trained Medical Personnel.



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# Your Team

- ✔ Work Well With Others – There Are Many Players From Various Agencies At These Incidents.



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### What Do You See



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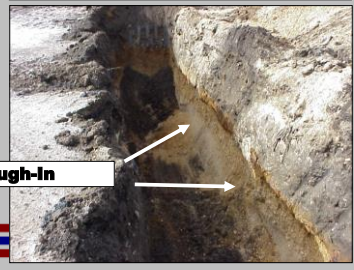
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### What Do You See



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### What Do You See



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### What Do You See



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### What Do You See



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### What Do You See



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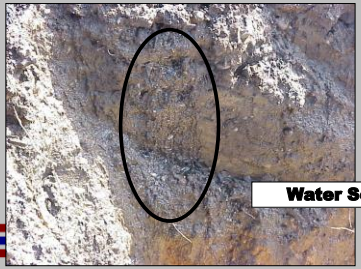
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### What Do You See



Water Seeping



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### What Could Go Wrong?



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### What Could Go Wrong?



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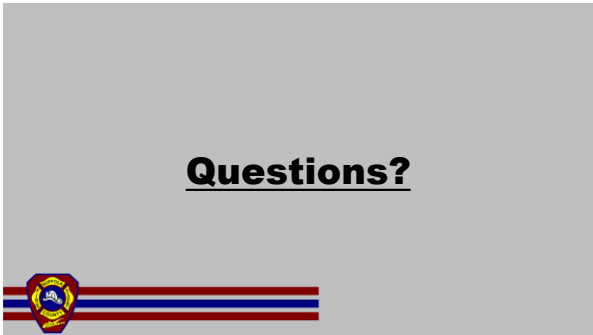
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