



TCM 2430 – Construction Safety

Week 09 – Demolition, Noise + Dust Control, and Excavation Safety



Dr. Tommy Tafazzoli



Demolition Safety



*Primary safety considerations
when planning a demolition project*
**1. Conduct a Thorough Site
Assessment**

- Conduct a thorough site assessment to identify potential hazards, including unstable structures, utilities, environmental contaminants, and nearby structures or properties. Understanding the site's condition is crucial for proper planning.



Primary safety considerations when planning a demolition project

2. Select the Appropriate Demolition Method

- Choose the most appropriate demolition method based on the site's conditions, the type of structure, and its proximity to other structures. Methods can include implosion, mechanical demolition, or manual demolition.

Primary safety considerations when planning a demolition project

3. Identify and Manage Hazardous Materials

- Identify and assess the presence of hazardous materials such as asbestos, lead-based paint, and chemicals. Develop safe procedures for handling, removal, and disposal of these materials in compliance with regulations.



Primary safety considerations when planning a demolition project

4. Securely Disconnect Utilities

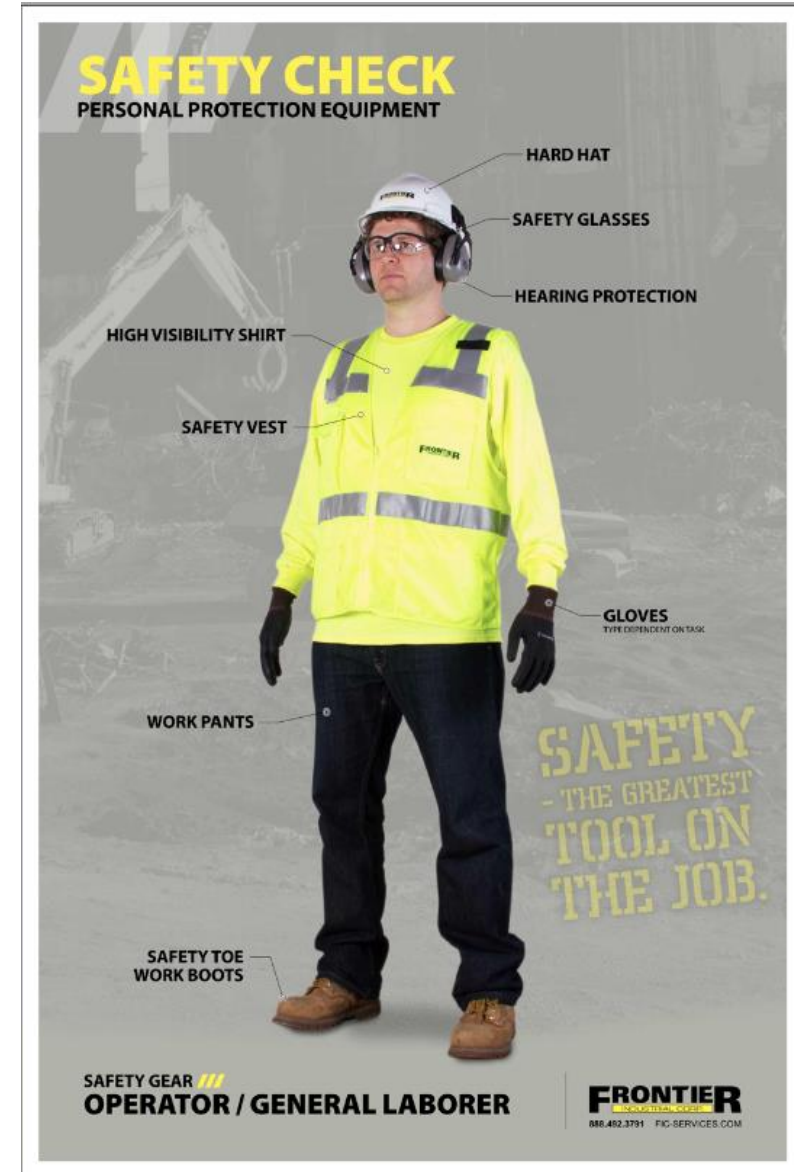
- Ensure that all utilities, including gas, water, electricity, and telecommunications, are safely disconnected or relocated before demolition begins to prevent accidents.



Primary safety considerations when planning a demolition project

5. Provide Adequate Personal Protective Equipment (PPE)

- Outfit all workers on the site with appropriate PPE, including hard hats, safety glasses, hearing protection, respiratory gear, and high-visibility attire.



Primary safety considerations when planning a demolition project

6. Assess Structural Stability

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- Assess the structural stability of the building or structure and implement shoring or bracing if necessary to prevent collapse during demolition.



Primary safety considerations when planning a demolition project

7. Control Dust and Debris

- Implement measures to control dust and debris generated during demolition, including the use of water sprays, dust curtains, and barriers to protect workers and the surrounding environment.



Primary safety considerations when planning a demolition project

8. Mitigate Noise and Vibration

- Develop strategies to mitigate noise and vibration to prevent adverse effects on workers and nearby residents. This may involve sound barriers, dampening materials, or scheduling work during less disruptive times.



Primary safety considerations when planning a demolition project

9. Maintain Equipment Safety

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- Ensure that all demolition equipment is properly maintained, inspected, and operated by trained personnel. Establish safety procedures for equipment operation.





Primary safety considerations when planning a demolition project

10. Craft an emergency response plan

- Formulate a comprehensive emergency response plan that outlines procedures for evacuating the site, rendering medical assistance, and addressing accidents, fires, or unforeseen incidents.

Primary safety considerations when planning a demolition project

11. Establish Clear Communication Protocols

- Foster transparent communication among workers and the public, utilizing signage and barricades to denote restricted areas and potential dangers.



Primary safety considerations when planning a demolition project

12. Comply with Permits and Regulations

- Assure that all necessary permits and regulatory requirements are scrupulously adhered to, including full compliance with local, state, and federal regulations governing demolition activities.



DEMOLITION

BUILDING PERMIT APPLICATION

Department of Community & Economic Development

321 E. 5th Street, Port Angeles, WA 98362
360.417.4817 | www.cityofpa.us | permits@cityofpa.us

CITY USE ONLY

App. #: _____

Received: _____

PROJECT INFORMATION

☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial ☐ Industrial ☐ Public

Project Address: _____

Tax Parcel No.: _____ Zoning: _____

Primary Contact: _____ (Property Owner: ☐ Yes ☐ No)

Phone: _____ Email: _____

OWNER INFORMATION

Name: _____ Phone: _____

Mailing Address: _____ Email: _____

CONTRACTOR INFORMATION

Name: _____ License: _____

Mailing Address: _____ Expiration Date: _____

Email: _____ Phone: _____

STRUCTURE CLASSIFICATION

☐ Residential ☐ Commercial ☐ Industrial ☐ Public ☐ Other: _____

PROJECT DESCRIPTION

Project Value (Materials + Labor): \$ _____

Please describe the proposed work: _____

REQUIRED APPLICATION MATERIALS CHECKLIST

☐ **Demolition Permit Application:** Please complete this form and have an authorized agent sign

☐ **Confirmation of ORCAA Demolition Notification:** An Olympic Region Clean Air Agency (ORCAA) Demolition Notification must be processed, and a letter or email of confirmation shall be provided as part of this application. Forms available at City Hall or www.orcaa.org/forms/

☐ **Waste Disposal Approval Letter:** A Port Angeles Solid Waster Transfer Station application shall be submitted to the Solid Waste Superintendent, and letter of approval shall be provided as part of this application. Forms available at City Hall or www.cityofpa.us/247/Regional-Transfer-Station

☐ **Site Plan (x2):** A detailed site plan, including all structures and structures to be razed

☐ **Building Permit Stormwater (BP^{SW}):** Submit if the project adds or replaces any hard surfaces

I have read and completed the application and know it to be true and correct. I am authorized to apply for this permit and understand that it is my responsibility to determine what permits are required and to obtain permits prior to work. I understand that plan review fees are not refundable after review has occurred. I understand that I will forfeit review fees if I withdraw the application before the permit is issued. I understand that additional information may be required when determined necessary by the building official and if the permit is not picked up/issued within 180 days of submittal, the application will be considered abandoned and the fees will be forfeited.

Date

Print Name

Signature (☐ Owner ☐ Contractor ☐ Representative)



Primary safety considerations when planning a demolition project

13. Champion Environmental Protection

- Enact measures to shield the environment, including proper disposal of hazardous waste, erosion control, and effective stormwater management.

Primary safety considerations when planning a demolition project

14. Provide Comprehensive Training

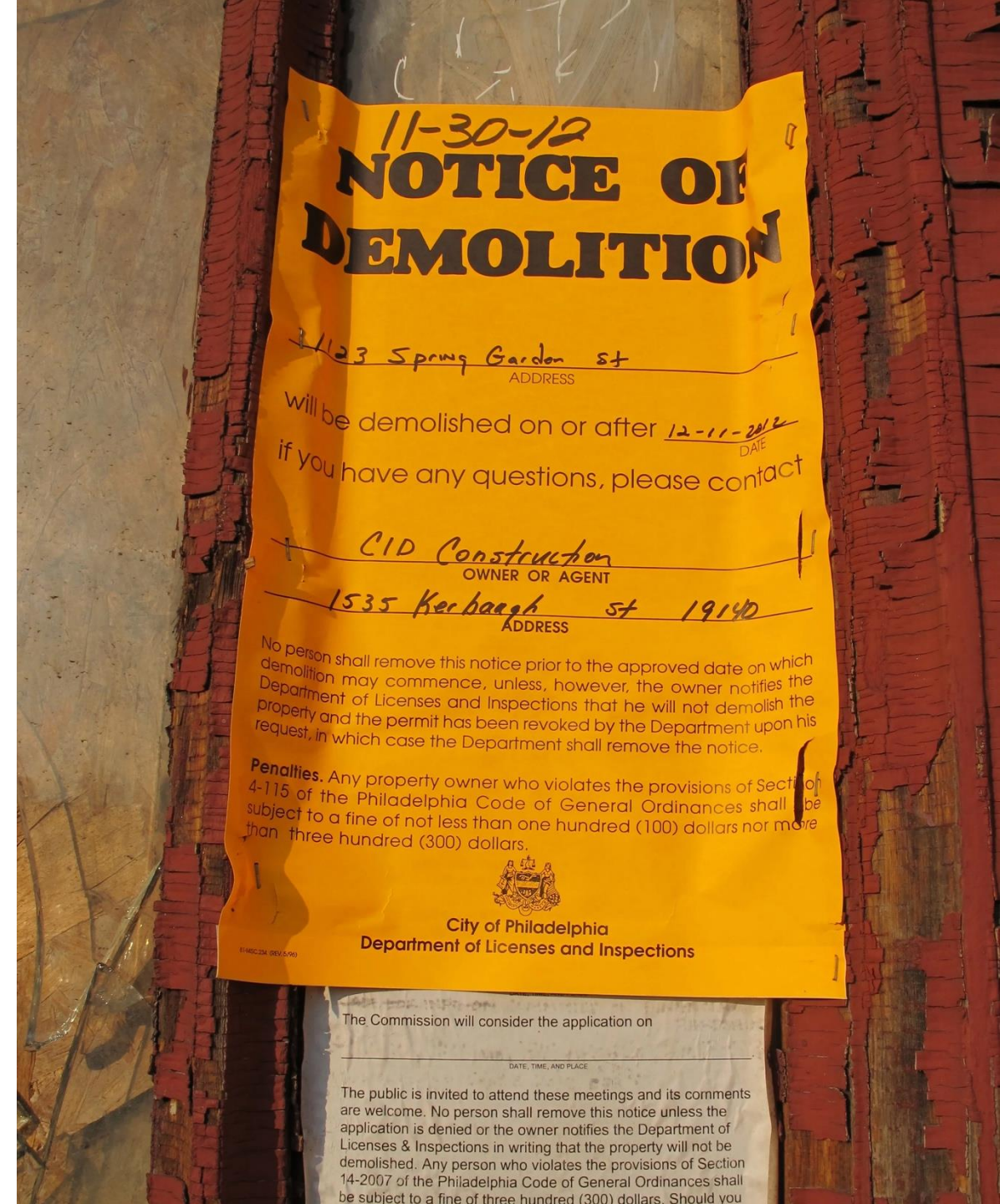
- Equip all workers participating in the demolition project with comprehensive training, encompassing hazard recognition, safe work practices, and emergency response procedures.



*Primary safety considerations
when planning a demolition
project*

**15. Implement Site Security
Measures**

- Apply security measures to thwart unauthorized access to the demolition site, thereby reducing the risks of accidents and vandalism.



Video

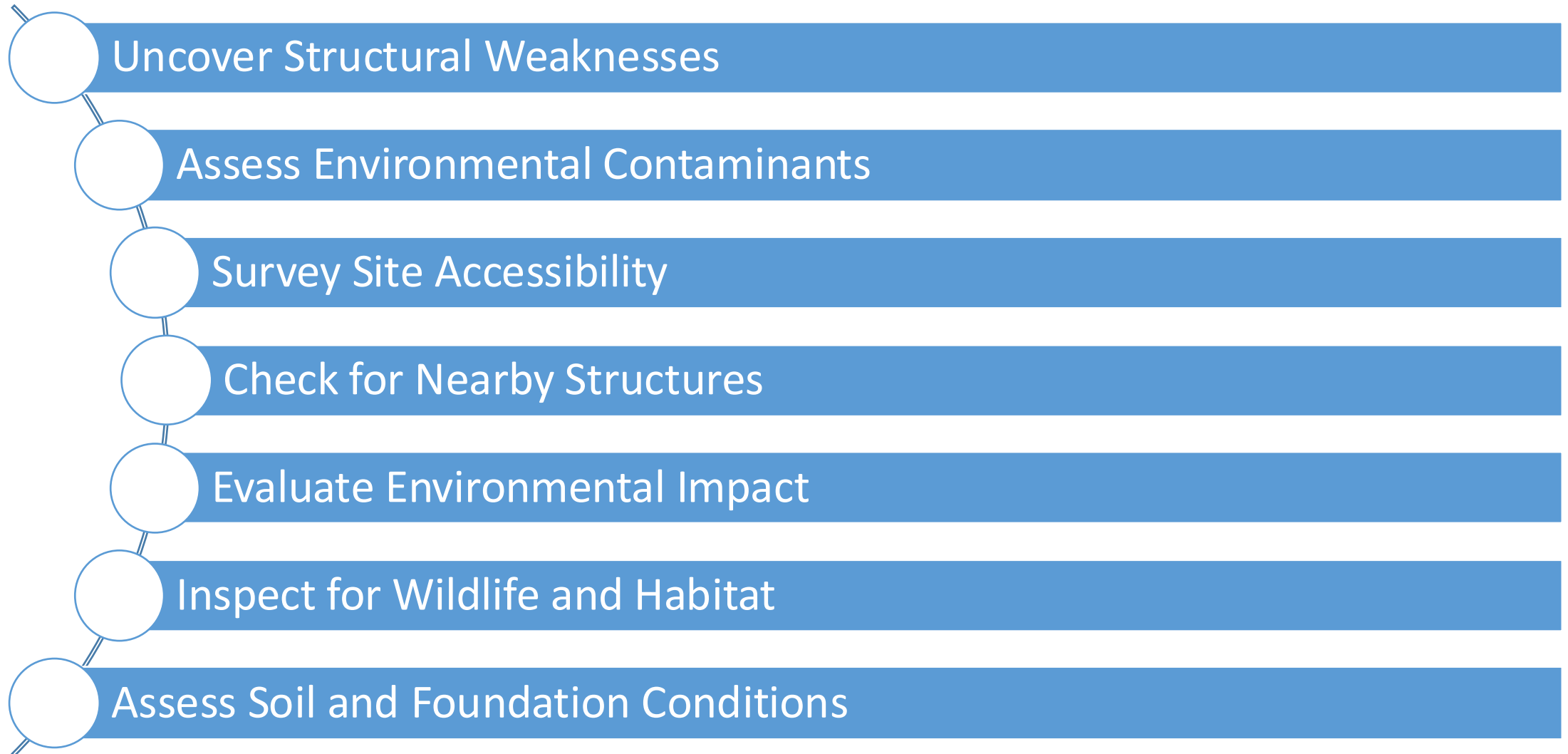
Demolition Safety //
FREE CONSTRUCTION
SAFETY MEETING
#construction #safety

https://www.youtube.com/watch?v=Uyz_kmVtjJo&ab_channel=BuilderSafety



Click here in full screen mode to open the video link

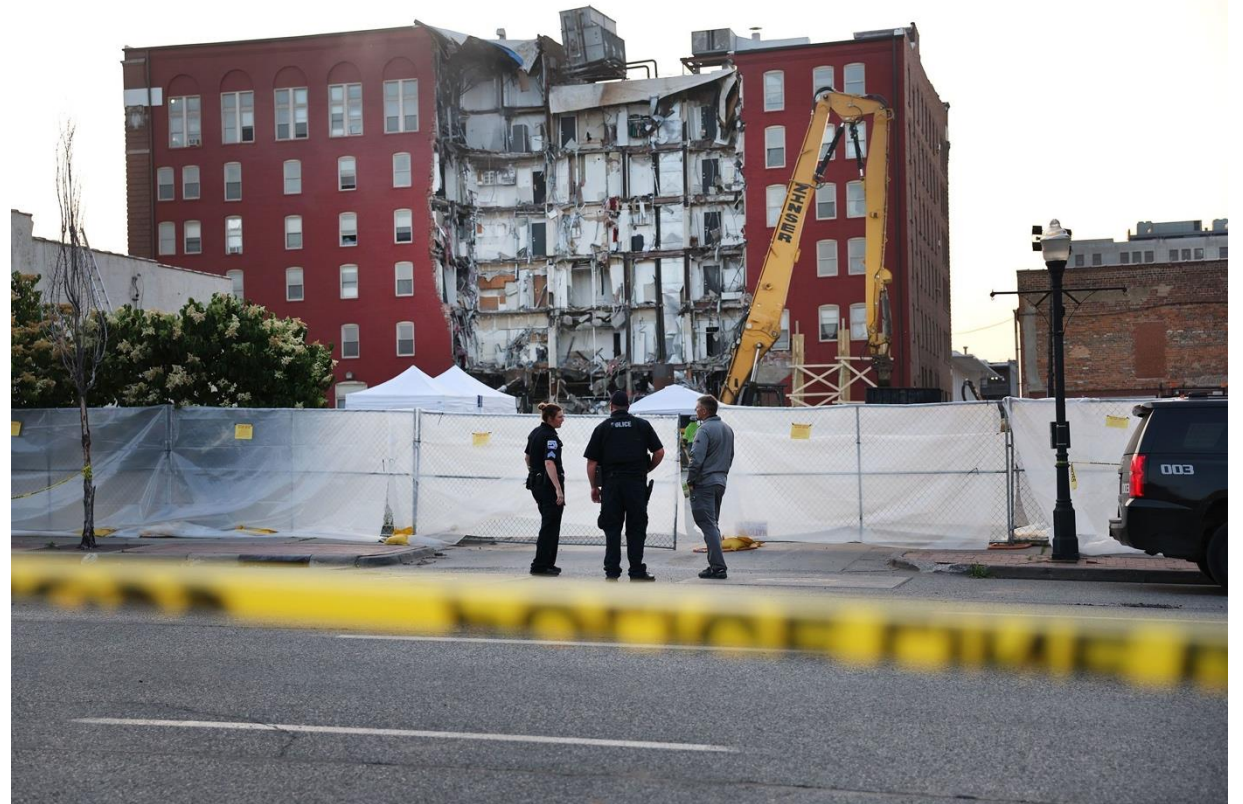
How should we conduct a thorough site assessment before starting demolition work, and what hazards should be identified during this assessment?



Conducting site assessment before starting demolition work

1. Uncover Structural Weaknesses

- To uncover structural weaknesses, various methods such as structural inspections, engineering assessments, non-destructive testing, and materials analysis can be employed. These methods help ensure that the construction or demolition project proceeds safely, efficiently, and with the highest quality standards.



Conducting site assessment before starting demolition work

2. Assess Environmental Contaminants

- Assessing environmental contaminants before demolition and construction is a proactive and responsible approach that benefits human health, protects the environment, ensures legal compliance, manages costs, and fosters positive relationships with stakeholders.
- It is an essential step in sustainable and responsible construction and demolition practices.



Conducting site assessment before starting demolition work

3. Survey Site Accessibility

- This is essential for safety, legal compliance, cost control, efficiency, environmental responsibility, stakeholder communication, and overall project success.
- It helps identify potential issues early, allowing for effective planning and risk mitigation.



Conducting site assessment before starting demolition work

4. Check for Nearby Structures

- This is essential for ensuring safety, complying with regulations, protecting the environment, avoiding legal issues, and maintaining positive relationships with the community.
- It helps ensure that construction and demolition projects proceed smoothly and responsibly.



Conducting site assessment before starting demolition work

5. Evaluate Environmental Impact

- It is essential to protect the environment, comply with regulations, promote sustainability, address community concerns, and ensure long-term cost-effectiveness and safety. It is a crucial step in responsible and ethical development practices.



Conducting site assessment before starting demolition work

6. Inspect for Wildlife and Habitat

- inspecting for wildlife and habitat before demolition and construction is essential for environmental conservation, legal compliance, ethical responsibility, and long-term sustainability.
- It helps identify and mitigate potential negative impacts on wildlife and their ecosystems, ultimately contributing to a more responsible and sustainable approach to development.



Conducting site assessment before starting demolition work

7. Assess Soil and Foundation Conditions

- assessing soil and foundation conditions before demolition and construction is a crucial step that ensures the safety, stability, and success of the project while complying with legal and regulatory requirements.



What hazards should be identified during site assessment before starting demolition work?

**Structural
Instability**

**Hazardous
Materials**

Utilities

**Environmental
Contaminants**

**Accessibility
and Egress**

**Proximity to
Other
Structures**

**Environmental
Impact**

**Wildlife and
Habitat**

**Soil and
Foundation
Conditions**

**Weather and
Climate**

Security Risks

**Historical
Records**

Video

Demolition Safety Tips - Safety First Safety Basics

- https://www.youtube.com/watch?v=Yf8-ooUy4sQ&ab_channel=ApprenticeshipEmploymentNetwork



Click here in full screen mode to open the video link



Dust Control



What safety measures should be in place to protect workers and the surrounding environment from dust and debris during demolition? *(Slide 1 of 3)*

Dust Control Plan

Develop a comprehensive dust control plan that outlines specific strategies and measures to minimize dust generation and dispersion.

Water Sprays

Utilize water sprays or misting systems to suppress dust at the source. This helps weigh down particles and prevents them from becoming airborne.

Dust Curtains and Barriers

Erect dust curtains or barriers around the demolition site to contain dust and prevent it from spreading beyond the work area.

Wet Demolition

Consider wet demolition methods where feasible, such as soaking materials before removal, to reduce dust creation.

Demolition Timing

Schedule demolition work during periods of lower wind speeds to minimize the spread of dust.

High-Efficiency Dust Collectors

Employ high-efficiency dust collection systems on equipment like saws and crushers to capture and contain airborne particles.

What safety measures should be in place to protect workers and the surrounding environment from dust and debris during demolition? *(Slide 2 of 3)*

Personal Protective Equipment (PPE)

Provide workers with appropriate PPE, including respiratory protection (such as N95 respirators), safety glasses, and full-body coveralls, to reduce exposure to dust.

Ventilation

Implement proper ventilation systems to maintain air quality within enclosed workspaces, reducing the concentration of airborne dust.

Debris Containment

Use debris chutes, nets, or catchment systems to collect falling debris and prevent it from scattering.

Waste Removal

Establish procedures for the safe and controlled removal of demolition waste, ensuring it is securely contained during transport to disposal sites.

Roadway Cleaning

Regularly clean adjacent roadways and public areas to minimize dust tracking onto streets and into neighboring properties.

Monitoring and Air Quality Testing

Conduct regular monitoring of dust levels using air quality sensors and perform air quality testing to ensure compliance with safety standards.

What safety measures should be in place to protect workers and the surrounding environment from dust and debris during demolition? *(Slide 3 of 3)*

Public Notifications

Inform neighboring residents and businesses about demolition activities and the potential for dust and debris, along with measures being taken to mitigate these issues.

Regulatory Compliance

Adhere to local, state, and federal regulations regarding dust control and environmental protection, obtaining any required permits or approvals.

Environmental Impact Assessment

Assess the potential environmental impact of dust and debris, including any impact on nearby water bodies, vegetation, or wildlife, and take measures to prevent harm.

Worker Training

Train workers on the hazards of dust exposure and proper safety procedures, emphasizing the importance of PPE usage and following the dust control plan.

Emergency Response

Develop an emergency response plan for addressing unexpected releases of dust or debris, including procedures for evacuation and containment.

Video

Resinator: Road Dust Control and Stabilization

- https://www.youtube.com/watch?v=9GSPxRc0y4Y&ab_channel=momartv



Click here in full screen mode to open the video link



Dust Curtains and Barriers



**Water Sprays for
dust control**





Wet Demolition



Noise Control

What are some common methods for controlling noise and vibration during demolition to minimize potential harm to workers and neighboring properties? (slide 1 of 2)

Isolate Machinery

Isolate demolition machinery and equipment by placing them on vibration-dampening materials or mounts to reduce the transmission of vibrations to the ground.

Install Acoustic Barriers

Erect acoustic barriers or sound walls around the demolition site to contain noise and prevent its propagation to neighboring properties.

Schedule Work Hours

Carefully schedule demolition work during specified hours to minimize disruption to nearby residents and businesses, particularly during quieter periods.

Adjust Impact Energy

Modify equipment settings to limit the impact energy applied during demolition, thereby reducing both noise and vibrations.

Opt for Quieter Techniques

Choose demolition techniques that generate less noise and vibration, such as precision dismantling or mechanical methods, when feasible.

Equip Silenced Machinery

Employ silenced or muffler-equipped equipment to diminish noise emissions during operation.

Utilize Dampened Pile Drivers

When applicable, use pile drivers equipped with dampening mechanisms to minimize vibration transmission into the ground.

What are some common methods for controlling noise and vibration during demolition to minimize potential harm to workers and neighboring properties? (slide 2 of 2)

Install Shock Absorbers

Fit heavy machinery and equipment with shock absorbers or isolators to minimize the transfer of vibrations.

Maintain Equipment Regularly

Perform routine maintenance on equipment and machinery to prevent noise and vibration issues caused by mechanical problems.

Monitor and Measure

Continuously monitor noise and vibration levels using appropriate instruments to ensure they remain within acceptable limits.

Notify the Public

Inform nearby residents and businesses about demolition schedules and potential noise and vibration impacts, as well as the measures being taken to mitigate these effects.

Comply with Regulations

Ensure compliance with local noise ordinances and regulations, obtaining any necessary permits or approvals.

Assess Environmental Impact

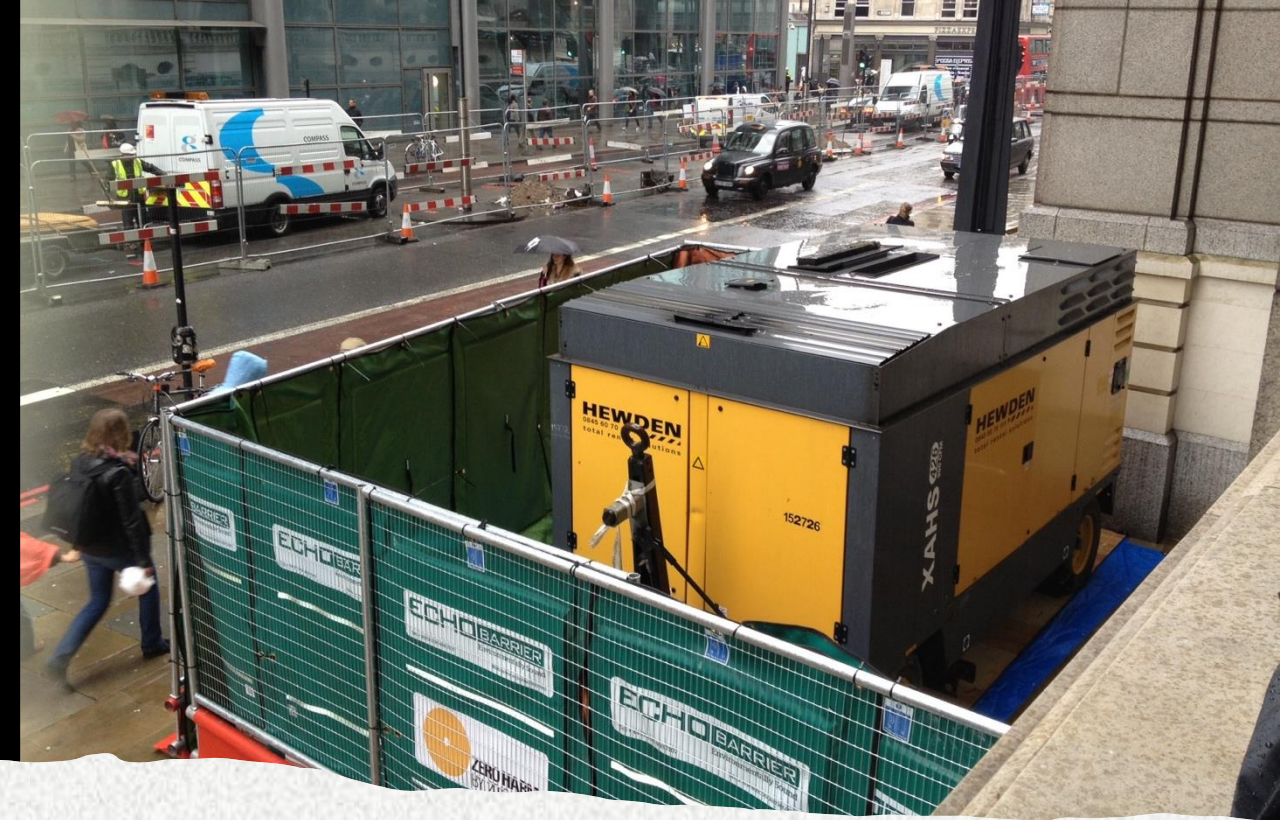
Conduct an assessment of potential environmental impacts caused by noise and vibrations, particularly on nearby water bodies, wildlife, and vegetation, and implement mitigation measures.

Train Workers

Train workers on noise and vibration hazards, emphasizing the proper use of equipment and techniques to minimize their effects.

Develop Emergency Response Plan

Create an emergency response plan to address unexpected increases in noise or vibration, including procedures for assessing and mitigating risks.



Isolating Machinery



Acoustic Barriers

How should utilities such as electricity, gas, and water be safely disconnected or managed before demolition begins? (slide 1 of 2)

Coordinate with Utility Companies

- Initiate coordination with local utility companies to schedule the safe disconnection or shut-off of electricity, gas, and water services to the demolition site.

Perform Utility Locating

- Execute utility locating services to accurately pinpoint the location of underground utilities, such as gas and water lines.

Notify Utility Providers

- Inform utility providers promptly about the demolition project and request temporary service interruptions or relocation of utility lines, if necessary.

Shut Off Power Sources

- De-energize electrical systems decisively by shutting off circuit breakers, disconnecting power sources, and implementing lockout procedures to prevent accidental reactivation.

Gas Line Isolation

- Isolate gas lines efficiently by promptly shutting off the main gas valve and ensuring that gas meters are securely locked or removed in accordance with local gas utility protocols.

Water Supply Termination

- Cease the water supply with precision at the main shut-off valve or meter, and systematically drain the water lines to prevent accidental flooding during demolition.

Label Utility Locations

- Clearly label utility shut-off points, and meticulously document their locations to ensure swift and unobstructed access for emergency responders and demolition crews.

How should utilities such as electricity, gas, and water be safely disconnected or managed before demolition begins?

(slide 1 of 2)

Lockout/Tagout Procedures

- Implement lockout/tagout procedures for electrical and gas systems with diligence to obstruct unauthorized or accidental reactivation.

Inspect for Leaks

- Conscientiously inspect gas lines for leaks post-shut-off, and promptly address any identified issues to eliminate safety risks.

Pressure Release

- If required, safely release pressure from gas lines using established protocols to mitigate the potential for unexpected bursts during demolition.

Document Disconnect Process

- Rigorously document the disconnection process, including specific dates, times, and responsible personnel, ensuring comprehensive records for future reference and safety documentation.

Utility Verification

- Thoroughly verify the successful completion of all utility disconnections, and maintain meticulous documentation before proceeding with any demolition activities.

Develop an Emergency Response Plan

- Formulate a comprehensive emergency response plan encompassing procedures for effectively addressing utility-related incidents or emergencies that may arise during the demolition.

Plan Utility Reconnection

- Strategically plan for the safe reconnection of utilities post-demolition, adhering to regulatory compliance and safety protocols.



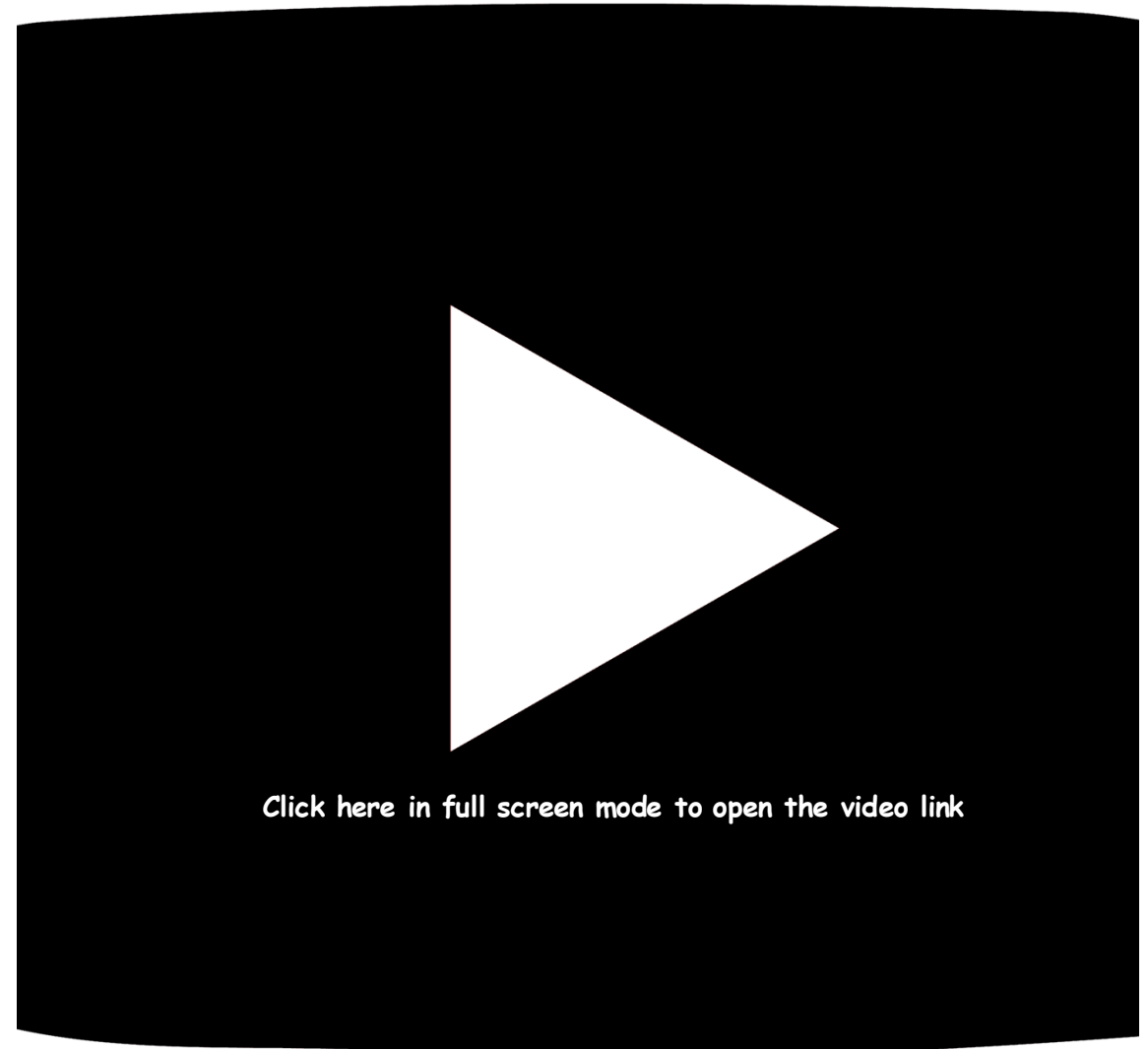
What is the importance of creating a demolition plan and establishing a clear chain of command for communication and decision-making on the worksite?

- Safety is paramount in demolition work.
- A well-structured demolition plan outlines safety procedures, hazard assessments, and emergency protocols.
- Establishing a clear chain of command ensures that safety decisions are made promptly and effectively to protect workers and the public.

Video

Learn How To Read Demolition Construction Drawings in 11 Minutes

- https://www.youtube.com/watch?v=dl7EpTbfhz8&ab_channel=SMITHINTHEBUILDING%21



Describe the safe handling and disposal procedures for hazardous materials, such as asbestos and lead-based paint, often found in older structures.

- It's essential to follow all local, state, and federal regulations and guidelines related to the handling and disposal of hazardous materials, and to engage qualified professionals and contractors experienced in dealing with asbestos and lead-based paint to ensure safe and compliant practices.
- Additionally, proper documentation of all procedures and disposal records is critical for regulatory compliance and accountability.



How can I ensure safety for equipment operators involved in demolition?

Training and Certification	Training should cover equipment operation, safety procedures, emergency response, and hazard recognition.
Conduct thorough Pre-Operation Inspection	Identify any potential mechanical issues or safety hazards. Verify that all safety features, such as emergency shut-off switches and alarms, are functioning correctly.
Conduct a comprehensive Site Evaluation	Identify potential hazards, such as underground utilities, unstable structures, or hazardous materials.
Safe Distance	Ensure that all workers and bystanders are at a safe distance from the demolition area and equipment during operation. 1. Establish barricades and warning signs to restrict access to hazardous zones.
Determine Load Limits	Be aware of the equipment's load limits and do not exceed them. Overloading equipment can lead to instability and accidents.
Controlled Demolition	Practice controlled demolition techniques, which involve systematically dismantling structures in a planned and orderly manner, rather than using brute force. Avoid swinging wrecking balls uncontrollably or using excessive force.



Excavation Safety

What is excavation, and why is it a crucial aspect of construction projects?

- Excavation is the process of digging, removing, and shaping the earth's surface to create cavities or depressions in the ground.
- It is a crucial aspect of construction projects because it provides the foundation for various construction activities, such as building foundations, underground utilities, basements, and road construction.
- Proper excavation ensures a stable and safe environment for the construction of structures and the installation of utilities, making it a fundamental step in the construction process.



What are the common hazards associated with excavation work, and how can they be mitigated?



Trench Collapses

- Excavation walls can collapse, burying workers. To mitigate this hazard, use protective systems like shoring, sloping, or trench boxes.

Falls

- Workers can fall into excavations. Guard the edges with barriers, ensure workers use fall protection equipment, and maintain safe access and egress.

Engulfment

- Soil or materials can engulf workers. Use protective systems, remove materials from the edge, and have a rescue plan in place.

Struck-By Incidents

- Workers can be struck by equipment or falling objects. Maintain safe distances, use spotters, and wear high-visibility clothing.

Utility Strikes

- Hitting underground utilities can lead to gas leaks or electrical hazards. Identify utility locations beforehand and use proper excavation techniques.

Hazardous Atmosphere

- Confined spaces in excavations can contain hazardous gases. Test the atmosphere, provide proper ventilation, and have rescue procedures in place.

Drowning

- Water can accumulate in excavations, posing a drowning risk. Pump out water and implement proper drainage measures.

Falling Loads

- Loads being lifted by equipment can fall into excavations. Ensure proper rigging and signaling during lifting operations.

What steps can be taken to identify and locate underground utilities before excavation to prevent accidents?



1. Contact Utility Companies:

1. Reach out to local utility companies, such as gas, water, electric, telephone, and cable providers, well in advance of excavation.
2. Request utility line location services, commonly known as "utility marking" or "utility locating."

2. Review Utility Records:

1. Review existing utility records and as-built drawings to gather information about underground infrastructure on the site.

3. Use One-Call Services:

1. Utilize one-call or "811" services, which are available in many countries, to notify all utility companies about the planned excavation.
2. One-call services will coordinate with utility providers to mark the locations of their underground lines.

4. Meet with Utility Representatives:

1. Schedule a pre-excavation meeting with utility company representatives to discuss the excavation plan and identify any specific safety precautions or requirements.

5. Mark Utility Lines:

5. After notification, utility companies will send personnel to mark the ground with color-coded flags or paint to indicate the location of their respective underground lines.
6. Each utility type is typically assigned a specific color code (e.g., yellow for gas, blue for water).

6. Verify Marks:

1. Verify the accuracy of the marks and their alignment with the excavation plan. If discrepancies are found, contact the utility company for clarification.

7. Use Non-Destructive Testing:

1. Employ non-destructive testing methods, such as ground-penetrating radar (GPR) or electromagnetic locators, to further verify the presence and depth of underground utilities.

8. Hand Digging:

1. When working near marked utility lines, use hand digging techniques or vacuum excavation equipment to expose the lines gradually and avoid damaging them.

9. Safe Work Distances:

1. Establish safe work distances from marked utility lines, taking into account the type of equipment being used and the depth of the utilities.

Video Safety Toolbox Talks: Trenching and Excavation Safety

https://www.youtube.com/watch?v=pP046HTKjkU&ab_channel=NAHBTV



Click here in full screen mode to open the video link