

Demolition

Short description

This section outlines the guidance for interior and exterior demolition and for controlling the hazards associated with this work.

Contact person

Andrew Richardson

Name

770-613-2999

Phone number

HSEQ

Functional Department

arichardson@cce-inc.com

Email address

Responsible

Brent LeVander

Name

HSEQ

Functional Department

Approval

Geoff Preisman

Name

President and CEO

Title

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1 Objective and area of application

The objective of this section of the HSEQ Manual seeks to inform Centennial employees and subcontractors of their obligations to develop the appropriate hazard prevention and control methodologies designed to prevent workplace injuries, illnesses and property damage occurring from demolition activities.

All personnel who may be involved in demolition activities on Centennial project sites shall be able to recognize the hazards associated with the different types of equipment and the safety precautions necessary to prevent incidents and injuries.

2 Superior and additional applicable documents

1000_GP_11_01_en_5.0 Global Policy on Health, Safety, Environment/Sustainability and Quality (HSEQ)

1000_GS_11_25_en_1.0 Global Standard on Hazardous Materials

EM 385-1-1 (2014)

ANSI Z133- American National Standard for Arboricultural Operations- Safety Requirements

This section of the HSEQ Manual applies to all Centennial employees and subcontractors who are performing work in Centennial facilities and / or on project sites. There may be more stringent requirements than this section as defined by specific State, local or contact specific HSEQ requirements. If there is a conflict between this section and other applicable regulations, the more stringent will apply.

3 Definitions

The following definitions of terms are important for an understanding of this procedure.

Term	Definition
ACM	Asbestos containing material
Asbestos fiber	A particulate form of asbestos 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1
Balling	Means of which demolition is carried out with a wrecking ball
Centennial	All Centennial employees, joint venture employees, subcontractors and business partners
Clamming	Means by which demolition is carried out using an equipment attachment that acts as a clamp.
Competent person	Person who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, or dangerous to employees and has authority to take prompt corrective measures to eliminate or protect against those hazards
Crystalline silica	A basic component of soil, sand, granite, and many other

	minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica
HSEQ	Health, Safety, Environment and Quality
HSEQ Director	Leads the HSEQ Team
N-95	The N95 respirator is the most common of the seven types of particulate filtering face piece respirators. This product filters at least 95% of airborne particles but is not resistant to oil
OSHA	Occupational Health and Safety Administration
RF	Radio frequency
UXO	Explosive weapons such as bombs, bullets, shells, grenades, land mines etc. that did not explode when they were employed and still pose a risk of detonation

4 General requirements for demolition activities

Precautions during demolition have three goals: Safeguarding the personnel on site, safeguarding the persons not connected with the demolition including the general public, and protection of property likely to be effected by demolition operations.

Demolition is the dismantling, razing, destroying or wrecking of any building or structure or any part thereof. Demolition work involves many of the hazards associated with construction. However, demolition involves additional hazards due to unknown factors which make demolition work particularly dangerous.

These may include:

- Changes from the structure's design introduced during construction
- Approved or unapproved modifications that altered the original design
- Materials hidden within structural members requiring special material handling
- Unknown strengths or weaknesses of construction materials, such as post-tensioned concrete.
- Hazards created by the demolition methods used

To combat these, employees located on demolition projects shall be fully aware of the hazards they may encounter and the safety precautions they must take to protect themselves and the public.

Before the start of every demolition job, Centennial supervision shall take a number of steps to safeguard the health and safety of workers on the job site. These preparatory requirements involve the overall planning of the demolition scope of work, including the methods to be used to bring the structure down, the equipment necessary to do the job, and the measures to be taken to perform the work safely. All planning work should be performed by a **competent person** experienced in all phases of the demolition work to be performed.

Demolition work may involve the following potentially hazardous operations:

- Utility strikes
- Structural collapse (struck by or caught-in-between)
- Hazardous material exposure (silica, lead, mold, asbestos)

- Working around heavy equipment (excavator's, bobcat, back hoe's, etc.)

5 Utility location

One of the most important elements of the pre-job planning is the location of all utility services. All electric, gas, water, sewer, and other service lines should be shutoff, capped or otherwise controlled at, or outside, the building/structure before demolition work begins. Each of the utility companies that are involved should be notified in advance, and its approval and services shall be obtained.

If it is necessary to maintain any power, water, or other utilities during demolition such lines shall be temporarily relocated and protected. The location of all overhead power sources should also be determined, as they can prove especially hazardous during any demolition that includes machinery (excavator's, back-hoes, etc.). All employees shall be informed of the location of any existing or relocated utility.

6 Inspection and Planning

This section describes the requirements for safe work practices when Centennial and subcontractors are engaged in work entailing the demolition of exterior structures.

6.1 Demolition Preparation

When preparing to demolish any structure, the first step must be the careful, detailed inspection of the structure by a competent person. Locating, securing, and/or relocating any nearby utilities is an important step in identifying potential hazards. Fire prevention and evacuation plans must be included within the Site Specific Safety Plan and captured within the Activity Hazard Analysis (AHA). If possible, Centennial supervision should consult architectural and engineering drawings. Centennial employees, JV partners and subcontractors should assess the structure for any defects such as cracks, openings or any other surface encumbrances.

Where there is a potential for exposure to hazardous materials such as lead, asbestos, silica, unexploded ordinance, etc., special care must be taken to ensure safe working conditions are established prior to work start up.

The following should be considered prior to beginning any demolition work with the potential for hazardous material exposure:

- Hazardous material locations identified
- Means of demolition (grinding, cutting, sanding, etc.)
- Construction signs and barriers to isolate effected areas
- Hazardous material disposal
- Air clearance criteria
- PPE requirements
- Specialized training
- Emergency and First Aid procedures
- Safe access and egress

In addition, methods of hazardous material mitigation require wetting methods. Centennial supervision should ensure that an adequate supply of water is available to carry out this method. **(See HSEQ Manual Section 25 Health Hazards in Construction)**

7 Exterior Demolition

When demolition on exterior structures is to be carried out, great care must be taken to avoid any persons to be struck by falling debris. Barricading around demolition sites is essential prior to any work to be performed. Identifying protective zones must be captured and illustrated in the Site Specific Safety plan and Activity Hazard Analysis alike.

7.1 Barricading

- The structure to be demolished should be adequately fenced and cordoned off
- Safety barriers shall be placed and constructed in a manner that they are legible, non-distracting and do not, of themselves, become hazardous
- Safety barriers shall be promptly removed or covered when a hazard no longer exists

Note: Please refer to HSEQ Manual Section 15 Protective Barriers, Warning Signs and Tags

7.2 Safety Measures during Structural Demolition

- Workers should not be deployed at different levels unless precautions identified in the site specific safety plan are implemented
- Demolition work should begin at the top of the structure and precede the levels below
- Concrete and/or masonry and other dismantled materials should not be allowed to accumulate in quantities which may endanger the stability of any floor or structural support
- Walls shall not be permitted to fall upon the floors to structure possibly creating an unintended collapse
- Wall sections shall be supported with lateral bracing if not designed to stand without additional support
- Where chimneys are present there must be a clear space for the fall of the structure at least 45 degrees on each side of the intended fall line and one and one-half times the total height of the chimney
- Stairs with hand railing should be kept in place as long practicable to provide access and egress

7.3 Safety Requirements during blasting operations

If the use of explosives is required for the demolition project, the Competent Person must ensure that OSHA standard 29 CFR1926, Subpart U is adhered to for blasting safety requirements.

8 Interior Demolition

8.1 Wall Removal

Centennial shall ensure that utilities have been located and clearly identified prior to any wall and floor penetrations. No wall section which is more than ten feet in height shall be permitted to stand without lateral bracing, unless such wall was designed and constructed to stand

without such lateral support and is in a condition safe enough to be self-supporting. Structural or load supporting members on any floor will not be cut or removed until all stories above such a floor have been demolished and removed.

8.2 Floor Removal

Openings cut in a floor shall extend the full span of the arch between supports. Before demolishing any floor arch, debris and other material shall be removed from such arch and other adjacent floor area. Planks not less than two inches by ten inches in cross section full sized shall be used. Safe walkways not less than eighteen inches wide, formed of wood planks not less than 2 inches thick or of the equivalent strength, shall be provided and used by personnel when necessary to enable them to reach any point without walking upon exposed beams. Planks shall be additionally laid together over solid bearings with the ends overlapping at least on foot. When floor arches are being removed, employees shall not be allowed in the area directly underneath and that area shall be barricaded to prevent access and signage posted to warn of hazards.

8.3 Debris Removal

Any chute opening where debris is dumped shall be protected by a guardrail 42 inches above the floor on which personnel stand to dump material (see HSEQ Manual Section 20 Fall Protection). All material chutes, and sections shall not exceed 48 inches in height measured along the wall of the chute. Openings when not in use shall be kept closed at all floors below the top floor. A substantial gate shall be installed in each chute at or near the discharge end.

9 Mechanical Demolition

No employee shall be permitted in any area which can be affected by demolition when balling or clamming is being performed. Only those employees necessary for the operations shall be permitted in this area at any other time.

The weight of the demolition ball shall not exceed 50% of the crane's rated load, nor shall it exceed 25% of the nominal breaking strength of the line by which it is suspended, whichever is less. When pulling over walls or portions of walls, all steel members affected shall have been cut free.

10 Amendment history

Date	Version	Revised content
07.01.2018	1.0	Initial Preparation

11 Appendix

There are no appendices to this section.