



## FESHM 7050: RULES FOR DEMOLITION

### Revision History

| <b>Author</b> | <b>Description of Change</b>  | <b>Date</b>   |
|---------------|---|---------------|
| Jim Niehoff   | Revision 1, Added FESHM Chapter formatting template, revised definitions of competent person and demolition to be consistent with ANSI 10.6. Added definition of qualified person to be consistent with ANSI 10.6. Modified flow chart to include DP-36. Moved Engineering Survey from Appendix to a Form, i.e., 7050-F1. | March 2012    |
| John Cassidy  | Revision 0, Initial release   | December 2006 |



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## 1.0 INTRODUCTION

Safeguarding our workers, adjacent properties, and utilities is a continuous process that begins in project planning and design phase and runs through documentation of as-built conditions. This chapter establishes a process to be followed by all divisions and sections when confronted with demolition as a phase of work. Demolition activities can range from dismantling a building, to remodeling an area within a building, to removing an experimental structure.

This chapter provides guidance regarding actions needed for any demolition activity when operating under FESHM 7010 ES&H Program for Construction, FESHM 7020 Subcontractor Safety - Other Than Construction or FESHM 2060 Hazard Analysis for Fermilab Employees. This chapter is not a primer on how to do demolition safely. Standards to follow when performing demolition can be found in Title 29 Code of Federal Regulations (CFR), Part 1926, Subpart T.

## 2.0 REFERENCES

- 29 CFR 1926 – Safety and Health Regulations for Construction
- Form 7050-F1 – Engineering Survey Check List
- FESHM 7010 – ES&H Program for Construction
- FESHM 7030 – Excavation
- FESHM 7040 – Concrete Cutting and Coring Activities
- FESHM 8060 – National Environmental Policy Act Review Policy
- FEHSM 8070 – Facility Decontamination and Decommissioning
- Director’s Policy 36 – Facility Reuse Program
- ANSI/ASSE A10.6, 2006 – Safety & Health Program for Demolition Operations

## 3.0 DEFINITIONS

- **Competent Person** - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who has the authorization to take prompt corrective measures to eliminate them.
- **Construction Coordinator (CC)** - A person specifically assigned to oversee the work of a construction subcontract for conformance to the subcontract agreements/documents. Construction Coordinators serve as the primary construction point of contact between the subcontractor and the laboratory. CCs do not directly supervise subcontractors employees or direct construction work.

*Note: The FESS Engineering Department generally furnishes Construction Coordinators, although at times, outside A/E personnel support subcontractor oversight under FESS direction.*



- **Demolition** – Dismantling, razing, destroying, or wrecking any building or structure or any part thereof.
- **Decontamination and Decommissioning File (D&D File)** - The D&D File is a permanent file maintained by the ESH Section identifying the location and nature of contamination in all structures and underground enclosures. See FESHM Chapter 8070.
- **Engineering Survey** – An evaluation of the conditions on a project site in preparation for the development of plans and procedures to bring the structure down.
- **Facility** – A structure including but not limited to, enclosure, shed, trailer, building, concrete slab, any constructed property that served a specific function or service.
- **Landlord** - The Division/Section/Center (D/S/C) responsible for the facility or space where work is planned or occurring
- **Qualified Persons** – Those who by possession of a recognized degree, certificate or professional standing or by extensive knowledge, training and experience in the demolition industry have successfully demonstrated their ability to solve or resolve problems relating to the subject matter of this chapter.
- **Task Manager (TM)** - A D/S/C designated individual specifically assigned to oversee subcontractor's employees and direct construction work activity. The TM has responsibility for assuring that hazard assessments are developed for the work, as prescribed in FESHM 2060 – Work Planning and Hazard Analysis. An approved TM list indicating individual experience and competency to direct specific work activities can be found at <http://esh.fnal.gov/xms/Audience-Pages/TM-CC-SC>

## 4.0 RESPONSIBILITIES

4.1 **The Division/Center/Section (D/C/S) Head** is responsible for ensuring implementation of the requirements of this chapter for those construction activities managed by his/her staff. The D/S/C head is also responsible for assigning a qualified CC/TM.

4.2 **The Construction Coordinator (CC)** is responsible for:

- Serving as first line of contact with the subcontractor field organization
- Monitoring and enforcing subcontractor compliance with their ES&H Program (or ISM plan, if required), the ES&H requirements in subcontract, and the hazard assessments for the scope of work.
- Reviewing and accepting the subcontractor hazard analysis, providing input as needed



- Ensuring that no work is performed by the subcontractor or sub-tier contractor until the hazard analysis has been accepted, and reviewed and signed off by each subcontractor and sub-tier contract employee on the job
- Obtaining the required work permits
- Preparing and distributing the Work Permit/Notification form
- Participating in Preconstruction meetings to establish ES&H expectations
- Ensuring that all subcontractor and sub-tier contractor employees attend Fermilab's Subcontractor Orientation and other Fermilab-provided training
- Documenting noncompliance and drafting related memos for the Construction Manager
- Participating in weekly construction progress meetings with subcontractor
- Ensuring that goods and services meet specifications
- Initiating call tree upon subcontractor report of an incident
- Obtaining incident report from the subcontractor
- Preparing independent incident report for the Construction Manager
- Tracking and reporting to ES&H subcontractor and sub-tier contractor work hours by the seventh day of the month following the end of the quarter
- Attending the subcontractor's daily planning meetings, weekly toolbox meetings, and monthly ES&H training
- Participating in subcontractor performance review at end of the subcontract
- Reviewing the condition of mobile cranes used as part of the project, using the guidance found in FESHM 7010 Technical Appendix 3, "Mobile Crane – Safe to Operate Review Items"
- Verifying the training of those involved in high hazard activities with specific training requirements identified in Section 5.7
- Additional training verification may be required based on the phases of work in the HA

**4.3 The Task Manager (TM)** is responsible for overseeing all aspects of the construction activity assigned. ES&H Responsibilities include:

- Planning and directing all work activities
- Assisting the subcontractor in preparing the HA, and obtaining all required reviews and acceptances (reference FESHM 2060)
- Reviewing HA with subcontractor employees, seeking their input, and making changes as appropriate
- Assuring that all subcontractor employees sign the HA
- Assuring that the subcontractor performs no work until the HA has been accepted, reviewed and signed off by each employee
- Acting as competent person for the job
- Assuring subcontractor employees have received all appropriate training
- Obtaining the required work permits
- Preparing and distributing the Work Permit/Notification (WPN) form
- Conducting pre-job work planning meeting with subcontractor employees to assure they understand the work activity, ES&H hazards, and mitigation measures.



- Notifying the Senior Safety Officer (SSO) of any employee injuries
- Coordinates and contributes to subcontractor incident investigations
- Informing the Senior Safety Officer (SSO) of ES&H noncompliance issues
- Submitting subcontractor performance review when requested (<http://esh.fnal.gov/xms/FESHM>)
- Reviewing the condition of any mobile crane used as part of the project, using the guidance found in FESHM 7010, Technical Appendix 3.
- Conducting and documenting daily inspections of excavations

**4.4 The D/S Landlord** is responsible for documenting and using FESHM 8070 and any other means necessary, to determine any contamination and hazardous materials in the structure to be demolished.

## 5.0 PROGRAM DESCRIPTION

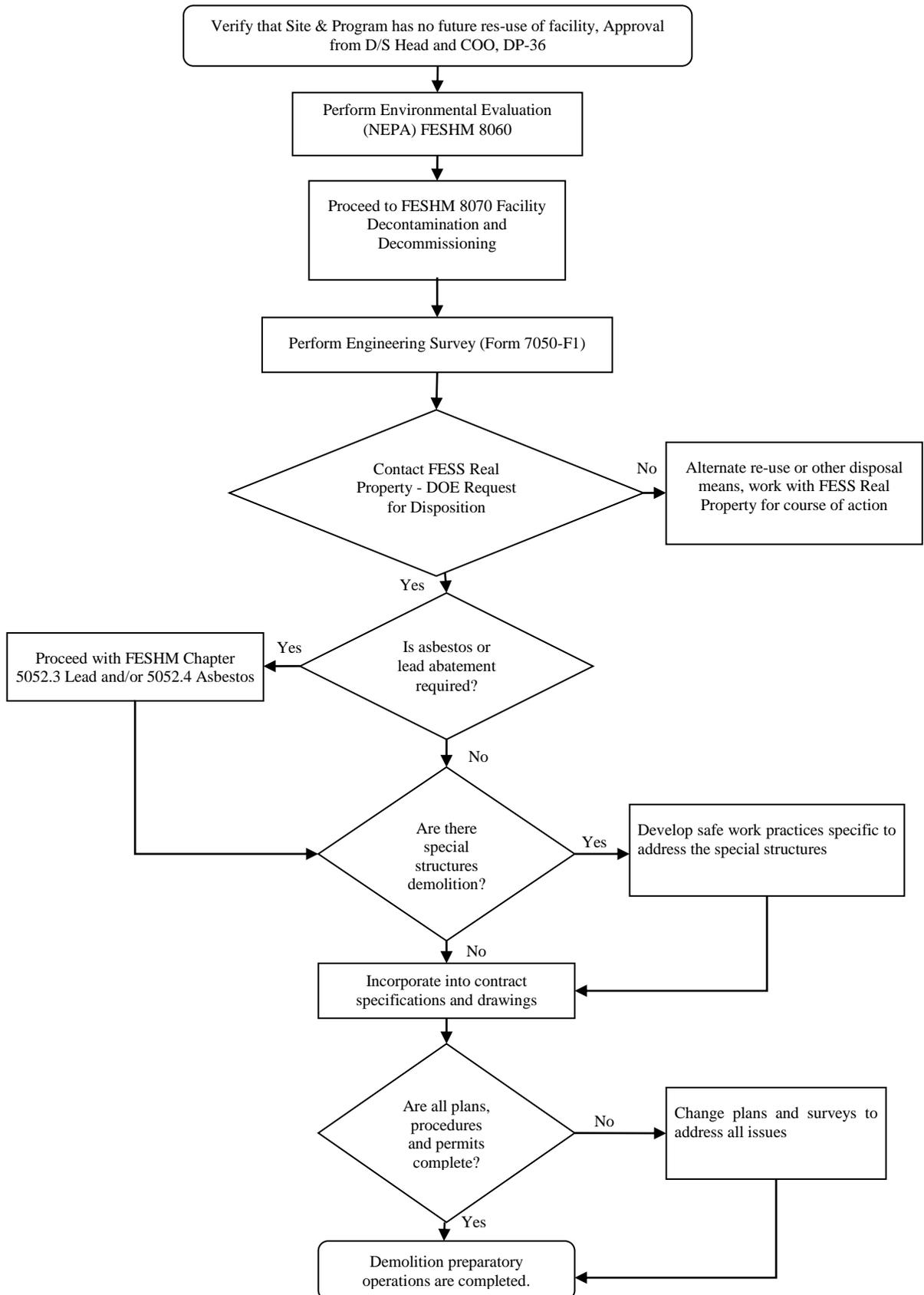
Demolition projects can consist of multiple work tasks that can be hazardous in nature. Premature structure collapse, utility location and hazardous materials are some of the most important elements to be considered during the design phase of all proposed work that involves demolition. A demolition project can be as complex as the wrecking of a multiple story building or as straight forward as the remodeling of an office.

Properly planning a demolition activity requires that an engineering survey be performed and documented to provide the persons responsible for the demolition the opportunity to evaluate the entire job. Depending on the project, documentation can range from contract drawings and technical specifications to a job hazard analysis. The scope of the engineering survey will depend on the nature of the demolition project.

The engineering survey must include but is not limited to, all electric, gas, water, steam, sewer, and other services lines shall be shut off, capped, or otherwise controlled, at or outside the building or demolition area before work is started. All workers shall be informed of the location of any existing or relocated utilities. If it is necessary to maintain any power, water, or other utilities during demolition, such lines shall be temporarily relocated as necessary and/or protected. The location of all overhead power sources shall also be determined, as they can prove especially hazardous during any machine demolition.

Procurement documents will clearly spell out Fermilab's expectations and requirements regarding demolition activities. Consideration will be given to selection of subcontractors based in part on qualifications to perform the demolition work safely.

The following flow chart should be used as a guide when planning demolition work.





## 6.0 PROCEDURES

- 6.1 Fermilab shall conduct necessary NEPA reviews in the initial phase of the activity planning process. Refer to FESHM Chapter 8060.
- 6.2 This chapter requires that a qualified person conduct an engineering survey of the structure slated for demolition. The purpose of the survey is to determine the condition of the framing, floors, and walls, so that any necessary measures can be taken to prevent the premature collapse of any portion of the structure. When indicated as advisable, any adjacent structure(s) should be similarly checked. Form 7050-F1 - Demolition Engineering Survey Checklist can be used as a guideline when a survey is performed.
- 6.3 The appropriate D/S/C designee must contact the Facilities Engineering Service Section (FESS) Real Property Department prior to commencement of demolition work, in accordance with Director' Policy 36. FESS Real Property Department contact information can be found at <http://fess.fnal.gov/gis/index.html> or ext. 3304.
- 6.4 Utility location is one of the most important elements of the pre-job planning. All electric, gas, water, steam, sewer, and other services lines should be shut off, capped, or otherwise controlled, at or outside the building before demolition work is started. If it is necessary to maintain any power, water, or other utilities during demolition, such lines shall be temporarily relocated as necessary and/or protected. The location of all overhead power sources should also be determined, as they can prove especially hazardous during any machine demolition.

The design team will use all reasonable means of identifying existing utilities:

- Existing utility maps
- Previous design and as-built documents
- Fermi-JULIE locating of utilities
- On site physical review
- Corporate knowledge

- 6.5 The design team will incorporate all known utility information into design and construction drawings and the inclusion of Exhibit A found in FESHM 7010.
- 6.6 The landlord is responsible for determining whether radiological contaminated material, asbestos, lead, or any other hazardous materials, chemicals, or gases are present at the site to be demolished. The landlord shall review the Decontamination and Commissioning File (D&D File) of the structure, building or site to identify any known contaminants. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated prior to demolition.
- 6.7 The design team will follow FESHM Chapter 8022 Waste Minimization and Pollution Prevention Awareness Program. All demolition waste shall be collected and sent to a recycling vendor to identify any demolition material that can be recycled, reused, or reduced. The design



team shall require from the vendor a report on the weight of materials recycled, and total weight.

**6.8** Depending on the nature of the demolition project, contract documents may include the following:

- Identify appropriate qualifications for subcontractors on projects regarding demolition activities. These will include past safety performance indicators along with minimal qualifications for the site superintendent as outlined in FESHM 7010.
- Clearly define the subcontractor's responsibility to protect and/or support adjacent structures and utilities during demolition activities.
- Preparatory meetings before the start of each new phase of demolition activities.

## **6.9 Procurement Phase**

**6.9.1.** Depending on the nature of the demolition project, the following may be required:

- A pre-bid meeting including discussion of requirements for demolition.
- Safety qualifications and qualifications of site superintendent if/as required in Exhibit A will be considered in the subcontractor selection.
- Pre-construction meetings including discussion of requirements for demolition activities.
- A demolition plan from the subcontractor including the means and method of demolition, site security from unauthorized access, and an emergency plan addressing fires, cave-ins, and evacuation procedures.

## **6.10 Construction Phase**

**6.10.1.** Demolition Activities:

- The TM/CC attends and takes a pro-active role in preparatory meeting with the subcontractor superintendent and competent person prior to the beginning of any demolition activity. Suggested agenda items include:
  - o Review permits, HA, LOTO, disablements
  - o Review shop drawings, materials on hand
  - o Discuss routing of existing utilities / interferences
  - o Confirm extent of demolition
  - o Establish stop points (inspections)
  - o Establish schedule for any further meetings
- All electric, gas, water, steam, sewer, and other services lines should be shut off, capped, and LOTO procedures implemented at or outside the building before demolition work begins. The subcontractor must verify with the TM/CC that all utilities have been abandoned and or LOTO procedures are in place.
- When utilities and other services in the area of the demolition cannot be de-energized or depressurized, the following procedures apply:



- o A special preparatory meeting must be held to review the known utility information, discuss the means and methods to be utilized, identify associated hazards, and develop an HA. Meeting attendees will include:
  - TM/CC
  - Superintendent
  - Competent Person
  - Subcontractor safety representative
  - ESH
- TM/CC presence is strongly recommended at the demolition site when:
  - o Demolition activity first begins or enters a new phase.
  - o Demolition activities are near energized electrical cable.
  - o Demolition activities are near existing structures.