

Demolition Planning

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Safe and efficient building demolition requires careful planning. Determining how and when demolition work is to be done is especially critical when extremely hazardous conditions or unique circumstances are present.

Since the dawn of civilization, people have demolished structures to make room for new structures, to rehabilitate existing ones, and to create new edifices with materials taken from existing structures. Cave dwellers began digging out adjacent earth and stone to expand their abodes. Later, demolition evolved into the removal of building parts to be used to build new structures. When the German archaeologist Heinrich Schliemann discovered the remains of Homer's Troy, he found it was the seventh city built on the same site. In the time of the Egyptian pharaohs, it was a common practice for the new ruler to tear down edifices built by his or her predecessor and to reuse the material to build a new palace or tomb. Portions of Hadrian's Wall in northern England were recycled to build housing and commercial structures in Newcastle and other towns in the region.

Today, demolition is a barometer of economic activity. When demolition occurs, it is usually a sign of coming growth, expansion, or renewal. Major cities in the United States and elsewhere are constantly renewed. Old factories are gutted and converted into new office spaces or residences. Industrial facilities are cleared to accommodate new machinery and equipment. Dilapidated housing is demolished to make way for new and more efficient residential uses.

The *Business of Architecture—2003 AIA Firm Survey* reports that 44 percent of the work done by architecture firms nationwide in 2002 was classified as building rehabilitation—defined as additions or improvements to existing buildings. The survey also states that rehabilitation represents a growing share of building construction activity. This trend indicates that architects are now planning, documenting, and specifying demolition work on nearly half their projects.

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Summary

Why a Client May Need This Service

- To plan for demolition in exceptionally hazardous conditions
- To plan for demolition of large and complex structures
- To maintain building use during demolition
- To protect structures or utilities close to demolition activity
- To recover assets of high value
- To plan for demolition in a highly sensitive natural environment

Knowledge and Skills Required

- Knowledge of demolition technologies and techniques
- Familiarity with construction methods and materials
- Ability to recommend appropriate demolition methods
- Knowledge of costs associated with demolition
- Knowledge of salvage values
- Awareness of recycling/landfill diversion opportunities
- Knowledge of governing regulations
- Ability to document environmental impact of demolition

Representative Process Tasks

- Conduct site investigations
- Analyze investigation results
- Develop a demolition plan
- Prepare budgets
- Qualify contractors

► According to the National Demolition Association, annual spending for demolition in the United States today is about \$3.5 billion.

► At some point, the entire current stock of buildings will undergo some form of demolition work.

CLIENT NEEDS

Building demolition involves tearing down, breaking up, and razing whole buildings or parts of buildings and includes the removal of machinery or equipment from buildings. To ensure the work can be accomplished safely, demolition planning is undertaken. This process includes consideration of environmental, public, and worker safety and other mandatory requirements, as well as cost, time, and client goals. Demolition planning involves close collaboration and interaction between the client, demolition planner, architect, engineers, regulatory agencies, contractors, and subcontractors.

Demolition Planning

Most building demolition planning can be addressed and adequately handled by the A/E project team. However, additional demolition planning expertise is sometimes warranted in some situations. For example, demolition planning is especially crucial for projects in which the removal of materials poses risks to the safety of people or adjacent property. For instance, the following situations may require a higher level of planning rigor and analysis:

- A structure to be demolished is close to others (e.g., in highly congested downtown areas).
- A contaminated structure requires special demolition techniques and material handling to avoid exacerbating dangerous conditions.
- A structure to be demolished has historic significance.
- A building with special construction features requires special demolition techniques (e.g., post-tensioned concrete structures, buildings with significant structural damage, etc.).
- Portions of an existing facility must be kept in operation while demolition work is carried out in adjacent portions.
- Assets of high value are to be salvaged for sale or for reuse.

For these project situations, among others, demolition contractors ultimately determine which demolition methods and techniques are used.

Building Demolition

Building demolition is achieved by a variety of means and methods, using many kinds of equipment and tools. Demolition experts can recommend which methods are appropriate for particular projects. For simplicity, demolition methods can be grouped under the categories of mechanical, implosion, and special.

Mechanical demolition. The most widely used method of building demolition today involves the use of various specialized mechanized equipment and tools. While the crane and wrecking ball have long been the symbol of large, high-rise demolition projects, demolition contractors employ a variety of high-reach excavators equipped with tools for crushing concrete and shearing steel at heights up to 120 feet. These machines can operate in confined work areas and can separate the building materials as they “chew” the building apart. Excavators equipped with special attachments, including hydraulic breakers, shears, and concrete processors, are also the machine of choice for demolishing foundations and handling debris and scrap metals. Interior demolition and selective demolition are most often accomplished with small, skid-steer loaders and small excavators equipped with a variety of hydraulic attachments that include breakers for concrete, shears for cutting small steel, and material-handling buckets and forks. In the last twenty years, effective remote-controlled machines have been developed that can be used in hazardous environments, confined spaces, areas that have been damaged or are structurally weakened, and areas that are sensitive to noise or vibration. These machines are also being used for selective demolition in radioactive environments.

Implosion. Implosion methods are very effective for bringing down high structures that would be difficult to reach with equipment or too expensive to demolish one floor at a time. These methods use highly specialized explosives to undermine the supports of a structure so it collapses either within its own footprint or in a predetermined path. The

Common Demolition Nuisance Factors

Controlling what can be considered nuisance factors associated with almost all demolition is an important aspect of demolition planning. These factors fall into three categories:

Dust. Dust is one of the most frequent problems caused by any demolition project. New technology has made it possible for equipment to control fugitive dust more effectively, preventing it from becoming a nuisance to neighbors and workers. Dust emissions can also be reduced by modifying demolition methods.

Noise. Noise levels on any construction project can be mitigated by using properly equipped sound suppression devices on heavy equipment and by scheduling noisy work activities to avoid, or at least reduce, noise levels during evening hours or special events.

Vibration. Vibration from demolition activities can be annoying to neighbors and, in some cases, can damage nearby structures. Work methods and scheduling can be effective means of controlling vibration-related problems.

implosion process is especially suited for high-rise buildings (usually more than twelve stories) and a variety of special structures (e.g., cooling towers, nuclear reactor containments, space launch towers, smokestacks, boilers, steel mill furnaces, and so on). Common explosives—usually various forms of dynamite and ammonium nitrate—are frequently used to blast heavy concrete such as that in bridge piers and machinery foundations. Only a handful of companies are qualified in this demolition method, and they almost always work as a subcontractor to a conventional demolition contractor.

Special demolition. Certain types of demolition require specialized handheld tools for cutting, chipping, drilling, and breaking small amounts of materials (e.g., removing concrete for a new door in an active hospital, cutting and removing a specified pipe in a rack containing piping that is in use, removing a terra-cotta arch for reinstallation, etc.). The tools for these tasks are mostly powered by hydraulic or pneumatic systems and can usually be moved by two men.

Special demolition projects are various. A typical project might require the contractor to remove partitions and suspended ceilings in a building area that is partially occupied, or cut new openings in concrete walls and floors for mechanical chases and doorways. Another special demolition type is careful removal of significant historic fabric in existing buildings. Often this is required when building systems are upgraded but the historic fabric (e.g., terra-cotta, windows, carved moldings, etc.) must appear to have been undisturbed afterwards. This process requires documentation prior to demolition and proper removal, cataloging, and storage of the historic building fabric.

Related Services

Demolition deals largely with wrecking and dismantling services, but some projects may require some related services as well. Services that often come up in relation to demolition include hazardous material handling, material salvage and recycling, site work, utility work, and building decontamination and mold control. Some demolition firms are able to perform some of these services, but often specialty contractors are used.

Hazardous materials handling. Some larger demolition firms can remove and dispose of hazardous materials such as asbestos-containing materials (ACM), polychlorinated biphenyls (PCBs), mercury vapor from fluorescent lights, petroleum products, and other such materials. Often, however, other firms (usually as subcontractors to the demolition firm) must be used to access these services. The cost and time required to remove hazardous materials must be considered when developing cost estimates, schedules, and sequencing for virtually all types of demolition projects.

Some demolition contractors and most general contractors are reluctant to assume liability for handling hazardous materials. Therefore, when the need for abatement is known ahead of time, it may be prudent to have the client contract directly for this service.

Material recycling. The recycling of building materials has become important for several reasons. First, it can be less expensive to recycle than to haul materials to land-

fills. Second, regulatory agencies increasingly require the diversion of demolition debris from landfills. Finally, building owners are becoming more sensitive to recycling and often include recycling as a requirement in their demolition specifications. A related form of recycling is investment recovery, which involves removal and sale of valuable machinery and equipment from industrial buildings. In some cases, the value of the removed assets is high enough for the demolition contractor to pay the owner for the rights to salvage and wreck the structures.

Building decontamination. Building decontamination is a significant issue in many demolition projects. In most situations, asbestos removal is the most common and costly form of such demolition. Less frequently seen are problems such as chemical contamination, biological contamination (bird droppings, etc.), petroleum contamination, and radiological contamination, which can present serious and costly technical problems.

Control of mold, especially in the hot, humid sections of the country, is another issue related to demolition work. Substantial mold contamination may require removal of affected materials such as drywall or wood components. It is important to require a complete inspection and decontamination of any mechanical systems or ductwork that may be contaminated with mold.

Site work. Site work, including earthwork, erosion control, and construction of parking areas and other site improvements, is often a part of a demolition project. Regrading a demolition site for natural drainage is a frequent job requirement, as are various efforts at erosion control such as seeding and placement of slope protection.

Utility work. In many projects, demolition work first requires utility work. Utility service must be terminated by cutting and capping utility lines or by rerouting them. Specialty subcontractors hired by the demolition contractor, the general contractor, or the building owner usually perform this work.

Building Demolition Terms

Many terms are used to describe demolition concepts, methods, and objects. Following are a few of those that may be encountered in demolition planning for buildings:

Debris. Building material waste produced by demolition (see demolition waste).

Deconstruction. The dismantling of a building from the roof down, one piece at a time. This process is most commonly used when the value of the construction materials exceeds the cost of the deconstruction (e.g., a historic structure with architectural features that will be carefully removed for reuse, refurbishment, or display).

Demolition waste. By-products (including debris) of demolition that cannot be recycled or reused (includes most wood products, drywall, and plastics).

Implosion. The use of explosives to take down total structures.

Material recycling. To process and reuse building materials for another purpose (e.g., crushed concrete for base materials, steel and other metals for reprocessing).

Mechanical demolition. The use of mechanized tools and equipment to demolish all or part of a building structure.

Salvage value. The market or monetary value of building materials, components, and equipment at the time they are removed from a building.

Selective demolition. The removal of selected building components in a manner that avoids damage to adjacent construction.

Scrap. Construction metals suitable for reprocessing (e.g., steel, copper, etc.).

SKILLS

Project design teams generally plan for required demolition work when no extraordinary environmental and safety risks are involved or when the demolition portion of a project is relatively straightforward. The architect typically prepares demolition drawings and specifications, which are usually issued as part of a construction bid package. When the demolition work is not part of the construction contract, demolition bid packages may be issued separately.

In some circumstances the architect and/or the client may need to consult a demolition specialist. The following are examples of situations in which additional expertise may be warranted:

- The project team is unfamiliar with the type of demolition needed.
- Special demolition procedures and techniques are required.
- Demolition cost estimates must be verified with a high level of accuracy.
- The project construction schedule can be greatly affected by the demolition work.
- Significant cost savings for the client are possible if materials removed during demolition are recycled.
- Compliance with community goals for diverting landfill materials can enhance the public relation aspect of a project.
- The project is so large that the client and project team wish to have their demolition plan corroborated.

For projects of this nature, the client or the architect will want to consult with a demolition expert.

Demolition Knowledge

Most demolition work proceeds in the reverse order of building construction, making an understanding of building construction methods and materials useful in demolition planning. Also required is knowledge of labor costs associated with removing and disposing of building materials, the value of removed assets, opportunities for landfill diversion through recycling and reuse of materials, and regulatory requirements that govern demolition work. Knowledge of demolition methods is important for determining the most appropriate way to remove, handle, and dispose of materials for a project.

Most demolition experts acquire their knowledge and skills from on-the-job training in the demolition and construction industries—either as owners of demolition firms or as construction field superintendents. Some have acquired demolition knowledge from experience as construction engineers with military organizations such as the Navy Seabees and the Army Corps of Engineers. While construction management programs at the nation's engineering schools continue to grow, formal courses dealing specifically with demolition have not been part of these programs. Purdue University, however, is working to add a specialization in Demolition & Reconstruction Management to its Building Construction Management program.

Some demolition contracting firms are also able to provide assistance for demolition planning and specifications. The National Demolition Association is a good source of information for locating demolition contractors. In addition, a small number of independent demolition consultants across the United States can be found using the Internet.

Demolition Planning Issues

Consideration of many factors is necessary in planning how to address the comprehensive demolition needs of clients. Major factors are the construction type of the structure to be demolished, safety issues, cost, site access, protection of adjacent structures, unforeseen conditions, scheduling, sequence of work, and the disposal, recycling, reuse of material. Another important factor is the environmental impact of the demolition effort.

Type of construction. The structural systems and materials used in a structure to be demolished are significant factors in determining the demolition approaches,

► Prior to the 1950s, hand labor was used to dismantle buildings from top to bottom. As heavy equipment became more versatile and labor more costly, the industry shifted to mechanical methods.

methods, and procedures appropriate for a project. Some projects, in particular, require special consideration. Examples are projects that involve removal of post-tensioned concrete members and projects that include demolition in historic structures or special purpose structures such as nuclear and chemical plants. Selective removal of building components in a way that protects remaining portions of the structure is another type of demolition that requires careful consideration of construction systems and materials in the demolition planning process.

Safety issues. All demolition work must ensure the protection of the worker, general public, and adjacent property. A demolition planner should work closely with the client to address any special considerations of the building occupants' activities that could cause a safety hazard during demolition. All mandated federal and local regulations should be identified, and the demolition contractor should be introduced to the safety submittal issue before any work plans or other submittal documents are produced or approved.

Cost. As with all aspects of construction, the cost of a demolition project can be of great importance to the success of the overall project. The most effective way to keep demolition costs to a reasonable level is to develop a comprehensive, realistic plan and associated specifications for the work. Reducing the unknowns is an important factor. One way to do this is to provide the client with a price schedule that includes unit prices and alternate pricing if it is likely some work may be added or deleted. This information will also remove ambiguities that could confuse the scope of work for bidders, which will make it more likely that the lowest bid will also be a responsible bid.

Site access. Downtown areas populated by high-rise buildings often present significant site access problems. Often, mobilization and erection of scaffolding requires street closures, traffic revisions, and construction of temporary protective structures. Similarly, access to locations in difficult terrain may require construction of roads, work platforms, temporary trestles, and methods of access for heavy equipment and trucks before demolition can begin.

Protection of adjacent structures. Demolition projects in dense urban settings mandate protection of property adjacent to the proposed demolition work. In addition, the choice of demolition method is greatly affected by the proximity of structures that are to remain. For example, some high-rise buildings cannot be demolished using explosives because of the location of nearby buildings or underground utilities.

Unforeseen conditions. As with most construction activities, unforeseen circumstances may arise during demolition. Therefore, a properly written demolition specification should include a "what if" section that requires the contractor to follow a certain procedure if circumstances occur beyond the anticipated scope of work. For example, a certified asbestos foreman may be needed on the demolition crew so that unexpected asbestos-containing materials can be recognized and removed before they become a health problem. Or, an archaeologist might be appointed to monitor the demolition and excavation work where artifacts or human remains can be expected to be found. The most effective way to deal with unforeseen situations is to maintain close communication between the client, the architect, and the contractor so that problems can be identified and corrected expeditiously.

Scheduling. When demolition is part of a building construction project, it is most often one of the first activities undertaken. For example, demolition is the first order of work when specific building components are to be replaced or reconfigured or when a new building is to be constructed in the footprint of an existing structure. Demolition can sometimes be the last activity, however. This usually occurs when a new facility must become fully operational before the facility it replaces can be demolished.

Work sequencing. Determining the sequence of demolition work is the common-sense matter of defining the order in which certain parts of the structure will be removed. Careful planning of the work sequence is important for many reasons, such as to have areas for new work cleared in a timely manner, to schedule difficult aspects of the demolition at times when liability exposure is reduced, or to avoid removal of foundations in wet weather. Environmental problems can be minimized or even avoided by carefully planning the work sequence (e.g., more dangerous or hazardous activities can be performed when the public and other contractors are not present).

Material recycling. Scrap metals, concrete, and asphalt products have been recycled for many years. However, as the costs of landfills increase and regulatory prohibitions become more stringent, separating and recycling building materials and diverting demolition debris from landfills has become a significant part of the demolition industry. The demolition planner, in concert with the client, can establish realistic recycling goals for a project contract. For example, the current high value of scrap metals virtually guarantees that all metals will be removed from demolition debris, and recycled concrete has become an important substitute for native rock in base materials for building slabs and roads.

Environmental impact. Some projects may involve making decisions about total demolition (to make way for new construction) versus selective demolition to prepare a structure for rehabilitation. In addition to a financial analysis of these choices, an assessment of the environmental trade-offs between them is another decision component. A life cycle assessment may consider impacts associated with building materials such as their acquisition; manufacture and transport; installation, use, and maintenance; and demolition, disposal, and reuse.

PROCESS

Demolition planning provides a basis for preparing demolition drawings and specifications, which in turn will be used by contractors to bid the work and develop demolition work plans. Demolition planning can be part of the architect's scope of design services or it can be carried out independently. Regardless of how the demolition planning is accomplished, its primary goal is to help ensure the demolition work is done as safely and efficiently as possible.

Demolition Planning Activities

Major demolition planning activities include investigating site conditions, analyzing site findings, verifying applicable codes and regulatory requirements, developing schedules and work sequences, preparing budgets, and determining appropriate methods for handling and disposing of debris and other demolition waste.

Site investigation. Investigating and evaluating site conditions is essential for any demolition project. This aspect of demolition planning includes both a site visit and a review of all available documents regarding the site and structures on it. The accompanying "Site Investigation Checklist" provides a basic guide for conducting a site investigation. Firms and consultants often have their own checklists, but the items shown in this sample list cover most of the subjects normally addressed.

Existing documents such as facility surveys, as-built drawings, and soils reports can reveal information not readily obvious from a visual inspection. Documents may report on subsoil conditions, bearing capacities, and enclosed building elements. In particular, historic documents may identify the potential for contamination of a structure by chemicals or heavy metals that may require special demolition and material-handling methods. Sometimes it is possible to interview someone who has extensive knowledge about a facility from working on the site for a long time. Such individuals may recall, for example, when and where certain chemicals were spilled or other events that led to conditions that may need to be addressed in the specifications. Recording site conditions in photographs or video during a site visit can help planners recall details and communicate how demolition efforts fit into the overall context of a project.

(Note: When the structural integrity of a building is in doubt, a structural engineer should be engaged to determine what special precautions are required. In some cases, temporary shoring or bracing may be needed before demolition occurs to prevent an unplanned collapse during the demolition work).

Analysis of site conditions. Site investigation findings are analyzed to help determine demolition work requirements and appropriate approaches for accomplishing the work. While the demolition contractor is responsible for the final selection of demolition equipment to be used, circumstances might restrict the use of some equipment due to access, noise, dust, or other factors.

Demolition planning addresses the termination or rerouting of utilities, either those serving the building or others in close proximity. Therefore, utility surveys are essential

► **Demolition by implosion is the most spectacular form of demolition in use today. However, it is used in less than 1 percent of demolition projects.**

Site Investigation Checklist

General Information

- Project name
- Project location
- Building owner/client
- Architect
- General contractor
- Contact person

Scope of Demolition (if known)

- Components to be removed
- Assets to be salvaged

Building Use and Operation

- Current use
- Previous use(s)
- Operational needs during demolition

Site Description

- Size
- Topography
- Natural features to be protected
- Retaining walls
- Water bodies (ponds, lakes, etc.)
- Number of structures
- Ancillary structures
- Utilities (under- and aboveground)
- Access/egress routes

Adjacent Elements

- Building structures (location and condition)
- Wetlands, rivers, lakes, canals, etc.
- Utilities

Building Description

Repeat for each building when multiple buildings are involved.

- Approximate age
- Number of stories above grade
- Number of levels below grade
- General condition
- Construction type (concrete, steel, frame, wood frame, composite)

Construction Materials

Identify types of materials for the following:

- Substructure
- Superstructure
- Roof
- Loading docks
- Exterior walls
- Interior walls/partitions
- Building systems
- Utilities

Equipment and Machinery

- Installed
- Salvageable and movable

Hazardous Substances

If evidence of such substances exists, a follow-up hazardous materials survey will be needed.

- Asbestos
- Toxic chemicals
- Biological hazards
- Other

Structural Hazards

- Post-tensioned concrete members
- Damaged structural components
- Cantilevered elements and overhangs
- Weakened floors/roof/walls
- Archways

Material Recycling

- Concrete
- Steel, copper, aluminum
- Timbers

Working Restrictions

- Restrictions on working hours
- Dust, noise, and vibration restrictions
- Seasonal conditions that may limit when work is performed

Codes

- Building codes
- Fire codes
- Environmental codes

Available Documents

- As-built drawings and specifications
- Building survey plans, soils reports, etc.
- Deeds, liens, and other legal documents

for most demolition projects to prevent service disruptions or the development of dangerous conditions. Site access and egress must also be considered to minimize disruption to traffic and the client's activities during demolition. Consultation with local authorities, early in the planning stages, should result in an acceptable plan.

Regulatory analysis. Demolition planning must account for local regulations regarding required permits, disposal sites, recycling requirements, and so on. Whenever possible, a demolition site is isolated from public access. In downtown areas, public protection is frequently afforded by covered pedestrian walkways and fabric-covered scaffolding. The Occupational Safety and Health Administration (OSHA) addresses worker protection requirements for demolition in a number of publications, and it is important that those involved in demolition planning make use of this information.

Schedule development. Preliminary demolition schedules are developed to fit logically into overall construction schedules. The sequence of demolition is planned to

accommodate other site activities, including client requirements, as much as possible. Determining a realistic timeline for demolition activity is an important part of scheduling. Demolition work can usually be accomplished in tight time frames if multiple shifts are possible or if space is sufficient to accommodate multiple demolition operations at the same time.

Budget preparation. Accurate and reliable demolition budgets must account for the cost of a variety of items. These include the demolition contractor's requirements for personnel and equipment, as well as any costs required by the client for a project (e.g., safety officer, fire watchman, pedestrian controller, traffic controller, and so on).

The following list contains most of the items generally covered in an estimate of probable cost for demolition work:

- Permits
- Mobilization and demobilization of equipment
- Engineering services
- Environmental surveys
- Site protection
- Utility work
- Preliminary work
- Supplies (e.g., scaffolding, lumber for protection, cutting gases, etc.)
- Demolition labor and equipment
- Security personnel
- Material handling
- Disposal fees
- Earthwork
- Cleanup
- New construction
- General and administrative expenses
- Credit for salvage
- Subcontractors

Material disposal and/or recycling. Most demolition projects specify that the contractor will be responsible for the legal disposal of all materials removed from the building. Particular client requirements, however, may be included in the bid documents (e.g., required crushing of concrete rubble for use on the site). Since recycling demolition materials has become an important part of nearly all demolition work, the demolition planning process should identify both local recycling requirements and the wishes of the client. Recycling can either increase or reduce demolition cost, depending on the circumstances of the job and the market value of the products to be recycled.

Qualifying Demolition Contractors

Both private and public clients frequently use a prequalification process to select potential bidders for demolition work. If the demolition consultant is part of the project team, this individual may assist in this process by reviewing information provided by prospective bidders. Typical considerations in the qualifying process include the following:

- Company's experience on similar projects
- References
- Experience of personnel designated for the project
- Safety record
- Financial strength
- Insurance coverage
- Bonding capacity
- Statement of approach

The preliminary work plan should include a schedule in some instances (e.g., for complicated structural components or when the owner wants to gauge the expertise of the contractor).

► AIA Document B305, "Contractor's Qualification Statement," can be used to obtain information from prospective demolition contractors.

Sample Content of Demolition Work Plan

A demolition work plan is a project-specific document that shows how the demolition contractor will accomplish the work in a safe and efficient manner consistent with the required scope of work. Following is a list of typical items that may appear in such a document.

Demolition contractor's name: _____

Project name: _____

Project location: _____

A. Preparatory Work

1. HAZMAT verification plan
2. Utility isolation plan
3. Emergency response plan
4. Mobilization of equipment and materials
5. Temporary power and water
6. Site security plan
7. Temporary shoring
8. Determination of the area potentially affected by the work

B. Protection during Demolition

1. Scaffolding (if required)
2. Dust control
3. Fire protection
4. Vibration and noise control
5. Protection of adjacent structure(s)

C. Demolition Methods

1. Interior demolition
2. Separation of building from structure to remain (if necessary)
3. Superstructure demolition
4. Foundation demolition
5. Demolition of site features (sidewalks, paved areas, etc.)

D. Material-Handling Methods

1. Traffic control
2. Soft demolition materials and M/E/P materials
3. Structural steel, machinery, piping
4. Concrete, CMU, brick, asphalt paving
5. Recycling
6. Disposal
7. Storage of salvage materials for reuse

Review and refinement of the demolition work plan. The demolition contractor prepares a demolition work plan to describe how the work will be accomplished. The plan should describe demolition methods, means for material handling, plans for maintaining safety and security on the site, and related issues. (The accompanying sidebar includes a sample work plan.) In reviewing the plan and subsequent submittals, the architect and the client have the opportunity to understand the contractor's approach for performing the work safely and effectively. Carrying out this review before demolition starts makes it possible to identify misunderstandings and potential problems when they can still be corrected or otherwise addressed.

A CONTINUING AND IMPORTANT ROLE . . .

Achieving safe and efficient building demolition requires careful forethought and planning. This means that demolition planning will continue to be an important part of the process of rehabilitating, restoring, and expanding the built environment, whether the extent of the demolition involves portions of buildings or the removal of entire structures.

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The AIA provides a contract document designed especially for alternative architectural services.

B102–2007, Standard Form of Agreement Between Owner and Architect without a Predefined Scope of Architect’s Services.

AIA Document B102–2007 is a standard form of agreement between owner and architect that contains terms and conditions and compensation details. B102–2007 does not include a scope of architect’s services, which must be inserted in Article 1 or attached as an exhibit. Special terms and conditions that modify the agreement may be included in Article 8.

The separation of the scope of services from the owner/architect agreement allows users the freedom to append alternative scopes of services.

AIA Document B102–2007 replaces and serves the same purpose as AIA Document B141–1997 Part 1.

For more information about AIA Contract Documents, visit www.aia.org/contractdocs/about

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