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National Institute of Building
Sciences.
Guideline for approval of
building rehabilitation.



Prepared by the

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BUILDING SCIENCES
Washington, D. C.

for the U. S. Department of Housing and Urban Development
Office of Policy Development and Research
under Cooperative Agreement H-5033

The Institute is grateful to the following organizations whose
representatives participated in the development of these guidelines:

- U. S. Conference of Mayors
- National League of Cities
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- AFL-CIO Building and Construction Trades Council
- Association of Major City Building Officials
- National Association of Home Builders
- National Trust for Historic Preservation
- U. S. League of Savings Associations
- National Housing Rehabilitation Association
- National Home Improvement Council
- Building Code Action
- Council of American Building Officials
- National Conference of States on Building Codes and Standards
- National Fire Protection Association
- American Institute of Architects



THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

This volume of HUD's rehabilitation guidelines examines the process of approvals. The process is familiar enough for new construction: approvals are required before construction, during construction, and during the building's life through maintenance inspections. The process for rehabilitation projects is more complicated and considerably less familiar, and this guideline will enable communities to improve upon it.

The need for an improved approval process is implicit in the development of HUD's eight rehabilitation guidelines, of which this is the second. The goal is to encourage housing rehabilitation nationwide by giving code officials, state and local policymakers, and citizens' groups a set of guidelines to be used in conjunction with building codes that were designed to protect health and safety primarily in new construction. No one wishes rehabilitated buildings to be any less safe or secure. The issue is inapplicability. Codes appropriate to a new building are rarely suited to a building constructed of different materials fifty or one hundred years earlier.

What these voluntary guidelines seek to do is to ease the connection between old and new--to recommend ways that current codes can be modified so that safe, sound rehabilitation can proceed more smoothly and at less cost.

The quality of this guideline and the seven others in the series is the result of the invaluable efforts of Robert Kapsch, program manager for HUD's Office of Policy Development and Research; William Brenner, project manager for the National Institute of Building Sciences; and David Hattis, consultant from Building Technology, Inc.

A handwritten signature in cursive script that reads "Moon Landrieu".

Moon Landrieu
Secretary

The Rehabilitation Guideline Series

The *Rehabilitation Guidelines* were prepared by the National Institute of Building Sciences for the Department of Housing and Urban Development in response to the requirements of Section 903 of the Housing and Community Development Amendments of 1978.

As Congress intended, the *Rehabilitation Guidelines* are not a code, nor are they written in code language. Rather, they are designed for voluntary adoption and use by States and communities as a means to upgrade and preserve the nation's building stock, while maintaining reasonable standards for health and safety. The term "rehabilitation", as used in the guidelines, includes any set of activities related to the general view of existing buildings as a resource to be conserved, rehabilitated, or reused.

This initial edition of the *Rehabilitation Guidelines* is published in eight separate volumes. The first four guidelines are designed for use by building officials, members of the executive and legislative branches of government, and related commissions and organizations involved in developing or implementing building regulations. These guidelines cover the following topics:

- 1 The *Guideline for Setting and Adopting Standards for Building Rehabilitation* provides an introduction and background to the building regulations that affect rehabilitation. It describes methods for identifying regulatory problems in a community, and recommends ways to amend, modify, or supplement existing regulations to encourage rehabilitation.
- 2 The *Guideline for Municipal Approval of Building Rehabilitation* examines the inherent differences between regulating new construction and regulating rehabilitation, and presents specific recommendations for dealing with rehabilitation within municipal building departments.
- 3 The *Statutory Guideline for Building Rehabilitation* contains enabling legislation that can be directly adopted by communities to provide the legal basis for promoting rehabilitation through more effective regulation.
- 4 The *Guideline for Managing Official Liability Associated with Building Rehabilitation* addresses the liability of code officials

Recommendation

Assure that any records used in the maintenance inspections of rehabilitated buildings adequately reflect all conditions of approval (established in Steps 2, 3, or 4) which may be subject to periodic inspection.

involved with the administration and enforcement of rehabilitation, and provides recommendations for minimizing liability problems.

The remaining four guidelines are technical in nature, and are intended for use by code officials, inspectors, designers, and builders. They cover the following topics:

- 5 The *Egress Guideline for Residential Rehabilitation* lists design alternatives for the components of egress that are regulated by current codes such as number and arrangement of exits, corridors, and stairs, travel distance, dead-end travel, and exit capacity and width.
- 6 The *Electrical Guideline for Residential Rehabilitation* outlines procedures for conducting inspections of electrical systems in existing buildings, and presents solutions to common problems associated with electrical rehabilitation such as eliminating hazardous conditions, grounding, undersized service, number of receptacle outlets, and incompatible materials.
- 7 The *Plumbing DWV Guideline for Residential Rehabilitation* presents criteria and methods for inspecting and testing existing drain, waste, and vent (DWV) systems, relocating fixtures, adding new fixtures to existing DWV systems, extending existing DWV systems, and installing new DWV systems in existing buildings.
- 8 The *Guideline on Fire Ratings of Archaic Materials and Assemblies* contains the fire ratings of building materials and assemblies that are no longer listed in current building codes or related reference standards. Introductory material discusses flame spread, the effects of penetrations, and methods for determining the ratings of assemblies not listed in the guideline.

Single editions of the *Rehabilitation Guidelines*—or copies of specific guidelines—are available at no charge, as long as supplies last, from HUD USER, P.O. Box 280, Germantown, Maryland 20767. Phone (301) 251-5154.

The *Rehabilitation Guidelines* are also available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

Acknowledgments

The material herein was prepared by the National Institute of Building Sciences on the basis of research performed by the National Conference of States on Building Codes and Standards and Melvyn Green and Associates. Technical reviewers for the Institute included Thomas Ware, William Dripps, Glendon Mayo, Norton Remmer, and James Pielert.

Overall management and production of the *Rehabilitation Guidelines* was directed by William Brenner of the Institute, with David Hattis of Building Technology, Inc. the principal technical consultant. Guideline cover graphics and layouts were designed by the Design Communication Collaborative.

Step 5 Maintenance Inspections

New Buildings

Once a building has received an approved final inspection, or has been issued a Certificate of Occupancy, it becomes subject to maintenance inspections throughout its life. These periodic, formal inspections may be made by a community's building department, but more often they are made by the fire and health departments or other authorities. These inspections are made to enforce property maintenance codes, fire prevention codes, and hazard abatement codes.

If such an inspection reveals that a building is not in compliance with the applicable code, a correction notice may be issued and enforced by the courts. If such noncompliance is found to be an imminent hazard, and the condition is not corrected immediately, applicable enforcement procedures must be followed.

Rehabilitation

While the maintenance inspection of rehabilitated buildings is in almost every respect the same as that for new buildings, there may be special circumstances related to the conditions of approval of a rehabilitation project which require extra consideration in inspections, such as:

- Posting of limited live loads (see *Guideline for Setting and Adopting Standards for Building Rehabilitation, Appendix 10*);
- Egress solutions which are unacceptable for the elderly or handicapped (see *Egress Guideline for Residential Rehabilitation*);
- Egress solutions which depend on the presence of alarms or sprinklers; or
- Posting of a second electrical service entrance and disconnect (see *Electrical Guideline for Residential Rehabilitation*).

- Establishing any increases in the scope of new work approved by the construction permit(s) as a result of nonconforming existing construction;
- Changing new work required by the condition of existing construction (e.g., obstruction of a new pipe chase by existing or concealed structural members); and
- Carrying out an increased number of performance tests to establish final acceptance of the work (e.g., see *Plumbing DWV Guideline for Residential Rehabilitation*).

A community can meet the unique requirements of rehabilitation by:

- Granting inspectors the authority to make decisions in the field;
- Establishing procedures to support those field decisions; and
- Improving the communication between plan reviewers and inspectors with regard to the scope, terms, and conditions of the work approved on the construction permit(s).

Seattle, Washington, for example, has established procedures which give inspectors more latitude to approve construction field changes in rehabilitation. Also, in major rehabilitation projects, Seattle plan reviewers visit the rehabilitation sites in order to expedite the start of projects.

Finally, the unique nature of rehabilitation suggests that special care be given to the retention and recording of construction documents, permits, and inspection reports in order to facilitate maintenance inspections and future rehabilitation.

Recommendation

Institute the necessary practices, including training if required, to accommodate the unique inspection requirements of rehabilitation, such as increased inspector authority, improved communications, specific inspection techniques, and performance testing.

Introduction

Most communities have laws, regulations, and codes which govern the construction and use of buildings. This regulatory system involves an approval process which consists of three distinct functions: 1) construction permits (prior to construction); 2) construction inspections (during construction); and 3) maintenance inspections (throughout a building's life).

This process is used to regulate both new building construction and rehabilitation of existing buildings. In the case of rehabilitation, where parts of an existing building remain, the first two functions (construction permits and construction inspections) often involve delays, additional paper work, cost increases, and other adverse effects because of problems such as the following:

- Characteristics of existing materials or equipment (e.g., strength, capacity, etc.) cannot always be determined accurately;
- Materials, equipment or methods of construction may be concealed from view and cannot be determined except by partial demolition;
- The size (e.g., height, width, thickness, length or shape) or location of existing building parts which are to remain may preclude design or construction solutions specifically covered by codes or regulations; and
- Complete designs or accurate scopes of work cannot always be made prior to the start of construction.

The new construction approval process is well known to everyone in the industry, and it functions efficiently. The rehabilitation approval process, on the other hand, needs to be better explained and understood. This guideline is intended to assist communities in developing more effective ways to regulate rehabilitation. This guideline will examine in detail five sequential steps of the approval process: 1) outreach program, 2) preliminary review, 3) construction permits, 4) construction inspections, and 5) maintenance inspections. The discussion of steps 2 through 5, which compares rehabilitation to new building construction, emphasizes the special considerations for rehabilitation and offers suggestions for improving the rehabilitation approval process.

Step 1 Outreach Program

An outreach program which clearly explains a community's approach to rehabilitation helps design professionals, contractors, and building owners. It may also help code enforcement personnel, since those whom they serve will be better informed. While outreach is not strictly a part of an approval process, it is an essential part of a comprehensive regulatory program to encourage rehabilitation.

A rehabilitation outreach program should have two basic inter-related features:

- Providing building owners, design professionals, and contractors with information about rehabilitation and its approval process; and
- Making those authorities having jurisdiction over a rehabilitation approval process more accessible to building owners, design professionals, and contractors.

A program of information dissemination might use any one or combination of the following opportunities in conjunction with improved access to rehabilitation authorities:

- Radio or television "spot" announcements;
- Newspaper advertisements;
- Adult education and professional continuing education courses, workshops, and conferences; and
- Free literature at banks, libraries, government offices, and "do-it-yourself" lumber and hardware stores.

Portland, Oregon, for example, has used television "spot" announcements to publicize aspects of its building department's programs.

An outreach rehabilitation program should provide information regarding:

- Permits required, and how, when, and where to obtain them;

With the issuance of a construction permit (Step 3), the authority having jurisdiction usually establishes its inspection schedule. For construction inspections, this may be:

- Inspections of specifically identified work items ("call-in" inspections by appointment);
- Routine inspections independent of the progress of the work ("drop-in" inspections following the inspector's routine); or
- A combination of the above.

The purpose of construction inspections is to assure the conformance of the work to the approved plans and to specific code requirements. This may simply require the inspector to observe the work in progress. In some instances, measurements are necessary (e.g., spacing of structural members or pipe sizes); sometimes, tests are required (e.g., strength of concrete or plumbing DWV air and water tightness).

Any work found not to comply with the approved plans or the code must be corrected to conform.

The construction documents, permits, and inspection reports are made a part of the community's official records once an approved final inspection has been made or after a Certificate of Occupancy has been issued.

Rehabilitation

The construction inspection process for rehabilitation projects is the same as that for new building construction. There are some aspects of rehabilitation, however, which require special consideration.

In rehabilitation, unforeseen conditions within existing construction are likely to be encountered. Also, construction documents are likely to be less detailed about work in existing construction. For both these reasons, rehabilitation may require more careful construction inspections with regard to:

- Determining the conformance of existing construction exposed during the work to applicable code requirements;

determine the condition and adequacy of existing materials, equipment, and installation methods. The data gathered forms the basis for establishing a rehabilitation scope of work (see Step 2: Preliminary Review).

- Findings of Preliminary Review - The findings from a Preliminary Review may be even more important to rehabilitation than to new building design and construction. These findings should be fully and carefully incorporated into the application for the permit(s) as a means to reduce delays in this step and in the Construction Inspection step which follows.

Recommendations

Amend the community's Construction Permit procedures and related fee structures, to utilize Partial Permits and Conditional Permits as needed to accommodate the needs of rehabilitation.

Establish construction document requirements appropriate to rehabilitation.

Develop a system which incorporates the conclusions of the Preliminary Review into Construction Permit processing.

Step 4 Construction Inspections

New Buildings

This step in the approval process consists of:

- Inspections during construction;
- A final inspection upon the successful completion of construction; and
- In some communities, issuance of a Certificate of Occupancy upon approval of the final inspection.

These are officially carried out by the authorities having jurisdiction, which may include not only the building department, but other departments such as fire and health.

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- Technical requirements and regulations governing rehabilitation;
 - Necessary construction inspections, and when they must occur;
 - Related regulatory and procedural matters; and
 - How, when, and where to obtain more information.

Increased accessibility to the authorities having jurisdiction over the rehabilitation approval process cannot only help those interested to secure information more easily, but it can also be a means to improving the rehabilitation process itself. A community might adopt any one or combination of the following practices to reach this goal:

- Assign one or more regulatory personnel to handle all rehabilitation projects;
- Locate all code permit functions in one office space or building when multiple permits are required;
- Issue one permit instead of multiple permits;
- Use neighborhood offices rather than a central office for the approval process;
- Hold open houses at the authorities' offices; and
- Extend the hours of the authorities' office operation to evenings and Saturdays so as to be more accessible to homeowners.

Seattle, Washington, for example, has assigned one plan check engineer to handle all rehabilitation. It is felt this provides program continuity and a familiarity with problems unique to rehabilitation, leading to a reduction in the number of formal appeals. Portland, Oregon, has instituted a regularly scheduled "homeowners' evening" at the building department (5-9 p.m.) to improve accessibility.

In sum, an effective rehabilitation outreach program can do a great deal to facilitate the subsequent steps of the approval process.

Recommendation

Develop a rehabilitation outreach program related to the community's approval process, and specifically designed to meet its needs.

Step 2 Preliminary Review

New Buildings

Preliminary reviews are becoming more widely accepted by communities. They are the real first step in the approval process for new building projects, and consist of an examination, with the authorities having jurisdiction, of the design, construction, and code issues related to those projects. It may be a formal, official review or just an informal, unofficial meeting. As preparation for the subsequent steps, this step should be taken at the earliest possible time, and should involve all the authorities concerned with a project in a community. Its aim is to get the project started on the right foot.

Some authorities having jurisdiction are quite willing to participate on- or off-the-record in the preliminary review of projects. Their participation is mandatory in the later steps of the approval process, and they understand that the purpose of this initial step is to solve potential problems before they become real problems and to expedite the approval process, thereby reducing delays, paperwork, and costs.

For new building construction, the preliminary review is usually a meeting (or a series of meetings on larger and more complex projects). Preferably, the meeting will include not just the building department, but all the jurisdictional bodies concerned (e.g., planning, zoning, design review, historic preservation, fire, health, traffic, etc.). In Bloomington, Minnesota, for example, the Fire and Life Safety Committee meets regularly and has members from every concerned jurisdictional body. The committee participates in formal preliminary reviews of all projects.

At the conclusion of the preliminary review, a general and clear understanding about the following is usually established:

construction drawings (working drawings) and specifications. Approval of these construction documents during the plan review may be withheld if some portion of the proposed work is not in compliance with the applicable code(s), or if the construction documents are inadequate in some way.

In the case of noncompliance, an applicant can either change the proposed work to comply or seek modification of the code(s) through the formal appeals process. If the construction documents are inadequate, an applicant should make the necessary changes or additions. A successful Preliminary Review (see Step 2) could reduce problems in this step to a minimum, thereby expediting the issuance of the construction permit(s).

With the filing of the construction permit(s), construction may begin.

Rehabilitation

The construction permit process for rehabilitation generally resembles that for new construction. Some aspects of the approval process however may be improved to better serve rehabilitation:

- Construction Documents - In some instances, rehabilitation construction documents need not be as extensive or detailed as those required for new construction. For less complex projects it may be possible to use a written description of materials and equipment as construction documents, supplemented, where necessary, with one-line diagrams, sketches, or product literature.
- Partial Permits - In some communities, Partial Permits may not be in common use, or may not be permitted. However, because their use is especially suited to the rehabilitation of selected parts of an existing building (such as the electrical or plumbing systems), the use of Partial Permits should be considered. The higher fee for multiple Partial Permits (as compared to a Full Permit fee) may be a constraint to rehabilitation which communities can modify.
- Conditional Permits - In rehabilitation, Conditional Permits are particularly useful to allow the selected demolition necessary for the exploration of concealed construction to

Step 3 Construction Permits

New Buildings

There are three basic types of construction permits for new buildings, used for three distinct circumstances:

- A Full Permit is used when there is enough information about the total scope of a project's work;
- A Partial Permit is used in some communities when there is enough information about only a part of the total scope of a project's work; and
- A Conditional Permit is used in some communities when there is not enough information to issue a Full or Partial Permit, but construction can begin safely on a portion of the work and can be completed when the missing information is determined and formally approved.

New building construction may have a series of Partial Permits (e.g., excavation, foundations, superstructure, and sewer hook-up) which together equal a Full Permit when the last Partial Permit is issued. Partial Permits necessitate a series of permit applications, plan reviews, and permit issuances. The total of Partial Permit fees usually exceeds the fee for a Full Permit.

Permit application and issuance is a formal, official step in the approval process which is carried out under the auspices of the authorities having jurisdiction. There are three stages involved in obtaining a construction permit:

- A formal application to the authorities having jurisdiction;
- A formal plan review of the construction permit application, and approvals by other jurisdictional bodies (e.g., zoning board and health department) if required; and
- The issuance or "filing" of the construction permit(s) upon approval of the application.

In new building construction, the construction documents needed for the application and plan review usually consist of detailed

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- Code requirements for a proposed new building's use and occupancy with regard to existing site conditions and proposed building plan layouts, heights, areas, materials, equipment, and construction methods;
 - Mandatory inspections;
 - Permit fee schedules;
 - Forms and applications which must be obtained from all the concerned jurisdictional bodies; and
 - Possible items of non-compliance with the codes for which a modification may need to be sought now or in the construction permit step through the formal appeals process (see *Statutory Guideline for Building Rehabilitation*).

Usually, only very preliminary drawings and outline specifications are necessary for a preliminary review. Even concept drawings, rough sketches, and material lists may be enough for simple buildings. For industrialized buildings, producers' literature may provide adequate information.

Rehabilitation

Preliminary review for rehabilitation projects is much the same as for new construction, but there are important differences in the purposes and the procedures that should be implemented.

Besides expediting the approval process and resolving potential problems, the preliminary review for rehabilitation has three additional purposes:

- To establish or clarify an owner's intent and proposed scope of work (e.g., change of occupancy, change of use, extent of construction), in order to clarify the code implications of the program;
- To determine the specific applicable code requirements and whether in fact permits are needed; and
- To establish an acceptable rehabilitation program, including the definition of any alternative or equivalent design or con-

struction solutions to code requirements which may be necessary.

If an owner has enough information about the building to be rehabilitated, a preliminary review may only require a single meeting; larger, more complex projects, however, may require additional meetings. In the latter circumstance, the information should be obtained by either the first or both of the following investigation procedures:

- A search by jurisdictional personnel of the records of all the jurisdictional bodies concerned with the past and present occupancy of the building to be rehabilitated; and
- An on-site investigation of the existing building by qualified jurisdictional personnel or by private engineers and architects.

An on-site investigation of an existing building may consist of any one or combination of the following:

- An assessment of the physical context of a building to determine the acceptability of some proposed rehabilitation solutions which depend on the context, such as those suggested in the *Plumbing DWV Guideline for Residential Rehabilitation* (e.g., single stack DWV solutions are not recommended for use where a sewer system is subject to flooding) or the *Egress Guideline for Residential Rehabilitation* (e.g., certain egress solutions may depend upon accessibility of the building by the fire department);
- A determination by observation of such physical conditions as structural integrity, electrical equipment damage, the number of electrical receptacle outlets, or the number of stories, suites, rooms or exits;
- A determination by measurement and/or calculation (which may in some cases require selected demolition; see Step 3 below) of such physical characteristics as area, height, plumbing DWV piping sizes, electrical conductor sizes, electrical load-carrying capacity, sizes of structural members, composition of fire resistant assemblies and fire resistance ratings, or widths and lengths of exitways;

- A determination by testing of the adequacy of function or performance level of such parts of an existing building as plumbing DWV piping, electrical equipment and devices, or fire resistance of archaic materials and assemblies.

See the *Electrical Guideline for Residential Rehabilitation*, the *Plumbing DWV Guideline for Residential Rehabilitation*, the *Egress Guideline for Residential Rehabilitation* and the *Guideline on Fire Ratings of Archaic Materials and Assemblies* for more detailed discussions of on-site investigation methods.

Any imminent hazard found in the investigation should be reported to the authority having jurisdiction for enforcement of applicable regulations.

When all the necessary information has been obtained, a second preliminary review meeting (or series of meetings) can take place. The understandings reached and the conclusions made pertaining to rehabilitation at the end of this step address the same issues as for new building construction. However, in those jurisdictions which issue construction permits, it may be concluded that a construction permit is not required given the particulars of a specific rehabilitation project. This decision by the authority having jurisdiction will take into account such factors as the quantity of rehabilitation work, the safety and health implications of the work, and whether a change of occupancy or use is involved.

Many rehabilitation projects will require essentially the same types of drawings, sketches, specifications, or material lists as new building construction. In some instances, one line diagrams or system schematics will be necessary for testing during a field investigation (see the *Plumbing DWV Guideline for Residential Rehabilitation*) or for clarifying existing conditions. For simpler or less extensive rehabilitation, a written description of the scope of work may be all that is necessary.

Recommendations

Initiate a Preliminary Review step for rehabilitation, or modify the current Preliminary Review procedure used for new buildings.

Develop on-site investigation procedures of existing buildings which are based on the nature of the community's building stock.