U.S. Department of Housing and Urban Development
PUBLIC AND INDIAN HOUSING

Special Attention of: Public Housing Agencies; Indian Housing Authorities; Regional Administrators; Directors, Offices of Regional Public Housing; Field Office Managers; Housing Management Division Directors; Chiefs, Assisted Housing Management Branches; Directors, Offices of Indian Programs

Transmittal Handbook No.:7485.2 REV-1

Issued: February 4, 1985

1. This Transmits

The Public Housing Modernization Standards Handbook 7485.2 REV-l, dated 2/85.

2. Explanation of Material Transmitted:

This Handbook provides design, construction and environmental criteria for the rehabilitation of public housing, including Indian housing, projects under the Comprehensive Improvement Assistance Program (CIAP). The standards establish a basis for uniformly evaluating the physical condition and energy efficiency of public housing projects to determine current rehabilitation needs.

Appendix 3 contains the procedures for public housing agencies (PHAs) to conduct the Physical Needs Assessment (Modernization) Survey, as required by Paragraph 3-8 of the Public Housing Comprehensive Improvement Assistance Program Handbook 7485.1 REV-2, and the Survey Instrument to be used for preparation and submission of an application for funding under the CIAP. This survey will provide data required and include compliance standards for modernization. Appendix 4 contains a suggested Project Cost Estimate Worksheet.

This Handbook incorporates policy clarifications which the Department has found necessary after additional experience in administering the CIAP. The significant changes involve format and restrictions. These are as follows:

- The standards are now formatted to clearly separate items which are mandatory from those which are project specific. Each technical chapter is divided into two sections: Section 1, Mandatory Standards; and Section 2, Project Specific Standards.

- A list of prohibited items clarifying which items2, may not be funded under any circumstances is, R-9-1, provided in Appendix 1.

- The Survey Instrument has been redesigned for easier use and will be available separately as a Form HUD-52827 (1/85).ppendix 1.

3. Applicability of Issuance:

This Handbook applies to modernization approved under the CIAP in Federal Fiscal Year (FFY) 1985 and thereafter.

4. Cancellation:

Public Housing Modernization Standards Handbook 7485.2 REV, dated 6/82

5. Information Collection:

The reporting requirements contained in Appendix 3 of this Handbook have been approved by the Office of Management and Budget (OMB). The OMB Number is 2577-0047.

Assistant Secretary for Public and Indian Housing

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

Program Participants
and Departmental
Staff

Reprint-January 1988

Public Housing
Modernization
Standards

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

SPECIAL ATTENTION OF: Regional Administrator; Directors, Offices of Public Housing; Field Office Managers, Public Housing Agencies;Indian Housing Authorities Directors, Indian Programs

TRANSMITTAL
Handbook No: 7485.2 CHG-2
Issued: March 29, 1993

---

1. This Transmits Handbook 7485.2 CHG-2.

2. Summary. Chapter 5, paragraph 5-3(b) is changed to revise the requirements for metal protector composition material to include materials other than asbestos millboard with equal or higher properties of fire resistance and heat absorbance.

3. Filing Instructions:

Remove	Insert

Handbook 7485.2 Pages 5-1 thru 5-8 dated 2/85	Handbook 7485.2 CHG-2 Pages 5-1 thru 5-9 dated 3/93

General Deputy Assistant Secretary
for Public and Indian Housing

W-3-1, W-2(H), R-1, R-3-1(PIH), R-3-2, R-6, R-6-1,

R-6-2, R-7, R-7-1, R-7-2, R-9, R-9-1, 138-2, 138-7

W-3-1 Directives Management Officers--Headquarters and Regions, library, ACIR (Advisory Commission on Intergovermental Relations)
W-2 HQ Office Directors, Special Assistants, those reporting directly to Assistant Secretaries
R-1 Regional Administrators, Deputy Regional Administrators
R-3-1 Bulk shipment to Regional Offices for selective distribution by program area
R-3-2 Directors, Administrative Services Divisions and Administrative and Management Services Divisions, and Administrative staffs
R-6 Category A offices - Office Managers and Deputy Office Managers
R-6-1 Category A offices - bulk
R-6-2 Category A offices - Division Directors
R-7 Category B offices - Office Managers and Deputy Office Managers
R-7-1 Category B offices - bulk
R-7-2 Category B offices - Division Directors
R-9 Directors and Deputy Directors, Offices of Indian Programs
R-9-1 Offices of Indian Programs - bulk

U.S. Department of Housing and Urban Development
PUBLIC AND INDIAN HOUSING

Special Attention of: Transmittal Handbook No.: 7485.2 REV-1 CHG-1

Issued: February 8, 1988

1. This Transmits changes to chapter 10 of the Public Housing Modernization Standards Handbook 7485.2 REV-1, dated 2/88.

2. Explanation of Material Transmitted:

This change updates the references in this Handbook regarding the Lead-Based Paint Regulations 24 CFR Parts 35 and 968.9, dated August 1, 1986.

3. Applicability of Issuance:

Change is applicable to all construction contracts in comprehensive modernization programs which are executed on or after the effective date of this change.

4. Filing Instructions:

Remove:	Insert:
Handbook 7485.2 REV-1	Handbook 7485.2 REV-l CHG-1
Page 10-3, dated 2/85	Page 10-3 dated 2/88
Page 10-4, dated 2/85	Page 10-4 dated 2/85

General Deputy Assistant Secretary
for Public and Indian Housing

stable soil conditions and safe use. Paved surfaces shall be free of missing portions and major cracks, holes, tripping hazards, spalling, dips or bulges. Paving shall be free of deterioration from moisture, decay or weathering.

Note: Major dips may be an indication of a problem with subsurface systems and should be investigated.

10-5. FENCING AND RAILING. Fencing and railing shall perform their intended function in an efficient manner. Fencing shall not create hiding places for potential criminals. Fencing and railings shall be stable with securely anchored members.

*10-6. FINISHES.

a. Paint. Paint to be applied on the interior and exterior of buildings shall not have a lead content greater than the amount permitted by 24 CFR Part 35. HUD regulations 24 CFR 968.9 require that all surfaces tested and found to have a lead content higher than permitted are to be treated as prescribed in the regulation to eliminate the hazards of lead-based paint poisoning. See 968.9(e) (3). Paint used on building exteriors shall be of a durable weather-resistant type to prevent excessive failure and defects. Painted surfaces shall be free of chalking, fading and/or blistering.

b. Millwork. Millwork, including windows, doors, trim, closets, etc., shall be sanded, primed and finish painted to prevent splintering or water infiltration. Millwork used on painted building exteriors shall be finished to prevent moisture penetration. Millwork shall be in safe and sound condition, stable and anchored as required. Millwork shall be free of splintering, water penetration, material deterioration, or the presence of termites.

c. Interior Areas Subject to Moisture and Water. In areas subject to water or moisture (e.g., kitchens, bathrooms and laundries), wall, floor and ceiling finishes shall be resistant to water, moisture, and damage from grease, detergent and normal household chemicals.

d. Wall and Ceiling Finishes. Before finishing, it shall be

determined that walls and ceilings are stable, anchored as required and free of moisture penetration. Walls and ceilings shall be free of holes, cracks, missing portions and material deterioration. Panels shall not sag, buckle or delaminate. All tile shall be secured and silicone caulked.

(1) Public Areas. Wall and ceiling finishes used in public and highly trafficked areas shall be of the kind and quality to provide durability and reasonable resistance to abuse and graffiti. When brittle or otherwise easily vandalized wall finishes are repeatedly abused, they shall be replaced with a vandal-resistant finish material up to 7 ft. above the floor. New or replacement finishes shall be hard-wearing, resistant to vandalism and graffiti and relatively easy to maintain. Plastic laminates, glazed tile epoxy coating or other equivalent should be considered because of their expected life, chemical resistance and easy maintenance.

(2) Bathrooms. Wall finishes at bathtubs and showers shall be water-impervious. Showers and bathtubs with showers shall have ceramic tile, porcelain steel panel or reinforced fiber glass panel finish on adjacent walls up to 6 ft. above the finished floor. Bathtubs without showers shall have a minimum of 4 rows of ceramic tile around the top of the bathtub. The finished product shall meet the standard in paragraph 5-4c. Gypsum board used as backing for wainscot in showers or tub enclosures shall be water-resistant. Insulating foil-backed wall board shall not be used.

(3) Elderly Projects. Abrasive wall products shall not be used in elderly projects.

e. Floor Finishes. Before finishing, it shall be determined that they provide safe support for all intended loads and are reasonably free of vibration or deflection. When exposed to water, all floors shall drain to maintain safe conditions at all times. Carpet shall only be provided in projects or dwelling units occupied by the elderly or the

---

W-3-1, W-2(H), R-1, R-3-1(PIH), R-3-2, R-6, R-6-1,

R-6-2, R-7, R-7-1, R-7-2, R-9, R-9-1, 138-2, 138-7
W-3-1 Directives Management Officers--Headquarters and Regions, library, ACIR (Advisory Commission on Intergovermental Relations)

W-2 HQ Office Directors, Special Assistants, those reporting directly to Assistant Secretaries
R-1 Regional Administrators, Deputy Regional Administrators
R-3-1 Bulk shipment to Regional Offices for selective distribution by program area
R-3-2 Directors, Administrative Services Divisions and Administrative and Management Services Divisions, and Administrative staffs
R-6 Category A offices - Office Managers and Deputy Office Managers
R-6-1 Category A offices - bulk
R-6-2 Category A offices - Division Directors
R-7 Category B offices - Office Managers and Deputy Office Managers
R-7-1 Category B offices - bulk
R-7-2 Category B offices - Division Directors
R-9 Directors and Deputy Directors, Offices of Indian Programs
R-9-1 Offices of Indian Programs - bulk

TABLE OF CONTENTS

CHAPTER 1. GENERAL CONSIDERATIONS

1-1. OBJECTIVES. The Modernization Standards Handbook provides design, construction and environmental criteria for the modernization of the nation's existing public housing stock. These standards establish a uniform basis for evaluating the physical condition and energy efficiency of the public housing stock to determine current rehabilitation needs in accordance with Federal housing objectives. These objectives are:

a. Projects that are safe, in physically sound condition and with all systems performing their intended design function;

b. Attractive, livable residential environments;

c. Energy efficient buildings and systems;

d. Increased security for tenant and project property, where required; and

e. Projects that can be efficiently maintained at a reasonable operating cost after rehabilitation.

1-2. USE OF HANDBOOK. This Handbook, with Appendix 3, Physical Needs Assessment Survey, is used in the preparation of the application for funding under the Comprehensive Improvement Assistance Program (CIAP). Its use is required by the CIAP Handbook 7485.1 REV-2.

a. Standards. These include mandatory standards (see paragraph 1-3) that must be met wherever there is a component that is not functional or serviceable and project specific standards that are met where determined by individual project need (see paragraph 1-5). The mandatory standards provide performance or prescriptive criteria to evaluate whether there is a deficiency. Where a deficiency is found, the correction of that deficiency may trigger the applicability of local code. In all cases, PHAs shall comply with local codes. The mandatory standards rely heavily on, but may exceed, local code where the local code does not meet HUD's standard for minimum habitability or there are opportunities for cost-containment or health and safety issues such as lead-based paint hazard abatement. Examples of cost-containment include energy conservation measures and extra durable materials to achieve lower maintenance and replacement costs. When the HUD mandatory standards conflict with any local code, the more stringent requirement shall apply.

b. Physical Needs Assessment.

(1) Use of Survey Instrument. When carrying out a

physical needs assessment, the Modernization Standards supplement the Survey Instrument in Appendix 3. The Survey Instrument contains 16 parts and is keyed to the individual technical standards. Therefore, public housing agencies (PHAs)* shall use the technical sections of the Handbook and related parts of the Survey Instrument tht apply to the physical characteristics of an affected project. The physical needs assessment may be individually tailored by PHAs for each specific project. For example, the sections dealing with the Building Envelope (2.0) and Dwelling Unit Survey (16.0) contain all of the necessary data for review of detached single family scattered site units comprised of structures of different ages and designs.

(2) Required Expertise. The Survey Instrument and standards are geared to the use of staff who have a working knowledge of construction and local codes. After a modernization program is approved, an architectural/engineering (A/E) firm may be hired to do the technical plans and specifications if the complexity or scope of the work warrants it. As provided for in the CIAP Handbook, where necessary, the PHA, with prior approval of HUD, may use an A/E to carry out the physical needs assessment.

1-3. MANDATORY STANDARDS. Public housing projects may be modernized to the extent necessary to meet the mandatory standards contained in this Handbook, which include both modernization and energy conservation standards. These mandatory standards are not building or construction codes, but must be used in conjunction with relevant local health, safety and building codes, hereinafter referred to as "relevant codes." The mandatory standards consist of three types, as follows:

a. Health and Safety. These standards relate to health and safety, especially where they would affect tenants and PHA employees. These items, in most cases, require emergency attention. They include, but are not limited to, items of compliance with Federal, State and local health and safety codes, regulations and ordinances;

b. Systems Integrity. These standards relate to items required to preserve the basic integrity of site and building systems, including conditions resulting from normal wear, abuse, and deferred maintenance, as well as conditions requiring major capital improvements; and

*All references in this Handbook to PHAs shall apply to Indian Housing Authorities (IHAs) as well as non-Indian PHAs.

c. Energy Conservation. These standards apply to energy conservation opportunities and devices where determined to be eligible (15-year or less simple payback period) in a specific project by an energy audit conducted by using HUD publication, Energy Conservation for Housing: A Workbook (HUD-PDR-700(3)), State standards or other HUD-approved methods. Before approving the replacement of relatively new or functional items, the HUD Office shall consider all of the alternatives and exercise professional judgment as to whether such replacement is in the best interest of HUD and the PHA. For example:

(1) Evaluation of Request to Replace a Furnace. The PHA's energy audit may indicate that the replacement of a seven-year old furnace (in very good condition) with a new energy efficient furnace which will cost $2,000 and would save an estimated $150 in fuel costs per year. The new furnace has an estimated life of 20 years. The new furnace is potentially eligible for funding because the simple payback period is 13.3 years ($2,000 / $150). As part of the same energy audit, further analysis indicates that the existing furnace can be retrofitted with a flue damper and electric ignition which will cost $500, have an estimated life of 10 years and save $100 in fuel costs per year. This alternative work has a simple payback period of five years ($500 / $100). Professional judgment indicates that approval should be given for the flue damper and electric ignition because the investment of $500 will extend the useful life of the furnace by 10 years while annually saving two-thirds ($100 vs. $150) of the energy that a new furnace would. At the end of ten years, the PHA would make further evaluation regarding the most appropriate heating system to use, including district heating.

1-4. PREMATURE REPLACEMENT. Serviceable building components (such as roofing), equipment (such as furnaces or domestic hot water heaters), appliances (such as ranges and refrigerators) or materials (such as paving) shall not be replaced prematurely (such as 100 percent replacement) except under special circumstances where energy conservation opportunities make it eligible (15-year or less simple payback) and where ongoing maintenance and operating costs will not be adversely affected. It is assumed that replacements will be made gradually over a period of time when they become necessary. Serviceable and functional building compononents, systems, equipment or materials that do not present

a safety or health hazard shall not be replaced prematurely even through they fail to meet the

mandatory standards that would be applicable for rehabilitation.

1-5. PROJECT SPECIFIC STANDARDS.

a. The mandatory standards may be exceeded only upon a determination by the Regional Office that the work is necessary or highly desirable for the long-term viability of a particular project, including site and building security. Project-specific work is determined in regard to the needs of each particular project and is not approvable across the board for all projects. Such work responds to differences in climate, location, building type, resident use and concerns, and management/maintenance systems. Examples of such work are found in Section 2 of each chapter. Efforts to excessively modernize buildings in order to compete with other subsidized housing in the community are expressly prohibited. Although all rehabilitation shall meet a modest, non-luxury standard, conversion or redesign may be approved on an exception basis where necessary to assure the long-term viability of a particular project.

b. Project specific work must be certified by the PHA as necessary or highly desirable for the long-term viability of the project. This certification is in lieu of any written justification and is included in the Board Resolution as part of the Final Application. In reviewing project specific work, the Field Office shall make reasonable judgements, based on the location, circumstances and past performance of the PHA, as to the level of any justification required. Such justification shall be minimal for PHAs with good performance.

c. The procedures for approval of all modernization work, both mandatory and project specific, are set forth in the CIAP Handbook 7485.1 REV-2. In general, these procedures involve PHA proposals, Field Office review and recommendation, and Regional Office approval.

1-6. APPLICABILITY.

a. Location. The mandatory standards apply to all PHAs, including Indian Housing Authorities (IHAs), located in the contiguous 48 states. PHAs located outside of these states shall appropriately modify these standards to reflect climatic and regional conditions.

b. Programs. For modernization of homeownership projects (Turnkey III and Mutual Help), the specific work shall meet the applicable standard.

c. Funding. This Handbook applies to modernization approved under CIAP in Federal Fiscal Year (FFY) 1985 and thereafter.

1-7. ORGANIZATION. There are one introductory and nine technical chapters which set forth the mandatory standards for major project components and systems. Performance objectives for each component and system are outlined at the beginning of each chapter to establish general criteria. Specific standards are then given for each subcomponent and subsystem. Each chapter is divided into two sections as follows:

a. Section 1, Mandatory Standards. The mandatory standards apply to all projects. When comprehensive modernization is completed, projects shall meet all mandatory standards for components that are not functional or serviceable or when special purpose, emergency or homeownership modernization is completed, projects shall meet the applicable mandatory standards for the specific work. With regard to premature replacement, see paragraph 1-4.

b. Section 2, Project Specific Standards. This section contains examples of work that are project-specific and does not apply to all projects. These examples are not intended to be all-inclusive. Also, repair and replacement guidance is provided to encourage cost-effective implementation for increased durability, ease of maintenance, project security and reduced operating costs.

1-8. RELEVANT CODES AND REQUIREMENTS. The mandatory standards are designed to complement other Federal, State, Tribal and local codes and requirements that apply to project sites and buildings. When these standards conflict with any applicable code requirement, the more stringent requirement shall apply.

a. Minimum Property Standards (MPS). Many older projects were built when living standards and system requirements were less stringent. This Handbook's objective is to bring projects up to a level equivalent to that intended by the HUD MPS for Multifamily Housing, as they relate to existing structures. Therefore, all modernization shall be consistent with Chapters 3 - Site Design, 4 - Building Design, 5 - Materials and 6 - Construction in both MPS for Multifamily Housing, HUD Handbook 4910.1, and for One and Two Family Dwellings, HUD Handbook 4900.1.

b. Industry Code. All modernization shall comply with the ASHRAE Standard 90-80A "Energy Conservation in New Building Design" and any revision thereof.

c. Accessibility for the Physically Handicapped. Modernization work, when required to provide accessibility to the physically handicapped, shall be

considered as necessary to meet the mandatory standards and shall comply with accessibility requirements established in 24 CFR Part 40, Standards for Design, Construction, and Alteration of Publicly Owned Residential Structures. See the CIAP Handbook 7485.1 REV-2 for application of this regulation.

CHAPTER 2. SERVICES

PERFORMANCE OBJECTIVES

2-1. General. Facilities for the following project-related services shall be consistent with the MPS and adequate for a safe and sanitary living environment:

a. Fire protection;

b. Mail handling and delivery;

c. Garbage collection;

d. Infestation control;

e. Laundry services; and

f. Management/maintenance services.

SECTION 1: MANDATORY STANDARDS

2-2. FIRE PROTECTION. All buildings shall be provided with fire protection systems consisting of egress and fire (smoke) detection, notification and control systems. Systems, materials and installations shall comply with all relevant codes or the standards in this section, whichever is more stringent.

a. Exits. All interior common spaces shall have direct access to a means of egress illuminated by 24-hour vandal-resistant lighting. For technical requirements for lighting, see paragraph 7-4. Systems shall be of the number, size, arrangement and capacity to allow prompt escape of tenants in the event of fire or other hazardous conditions.

(1) Signs. Code required exits that are not immediately visible shall be marked by adequately sized and illuminated exit signs as determined by relevant codes.

(2) Fire Escapes. Fire escapes shall be continuous, constructed of non-combustible materials and have skid-resistant treads. Fire escapes leading to public areas with counterbalanced ladders shall not extend closer than 10 feet to the ground. Fire escapes shall be stable, anchored as required, and free of rust or material deterioration. All required ladders, treads and landings shall be present, in sound condition and not substantially deformed.

b. Fire Detection, Notification and Control. Fire and smoke detection, notification and control systems and related equipment shall be provided as determined by relevant codes. Dwelling units shall be provided with an automatic electric smoke detector located in a hallway adjacent to the bedroom(s).

Detector installation shall be governed by relevant codes. Smoke detectors for deaf tenants shall have alarm systems within the bedroom itself. Smoke detectors for units housing the deaf shall have appropriate alarm devices for both deaf and hearing family members.

c. Equipment. Fire protection equipment, including fire hoses, extinguishers and valves, shall be protected from vandalism and misuse in a manner that does not limit emergency use. Fire equipment shall be clean, operable, in sound condition, and free of corrosion or deterioration. Fire hoses shall be free of holes, cracks or rigidity due to dried out materials. Operable sprinkler systems shall not be obstructed by hung ceilings, objects or paint.

d. Fire-Resistance Ratings. Systems components and materials whose composition is part of the development of a fire-resistance rating (including construction and finish materials in nondwelling spaces) shall have fire resistance qualities appropriate for the location and use. (Construction materials, finishes and new and replacement funishings in nondwelling spaces such as administration and community rooms should be made of fire-retardant material.)

2-3. MAIL HANDLING AND DELIVERY. Each dwelling unit shall be provided with either an exterior weather-resistant mailbox, an interior mailbox or a suitable mail slot in the dwelling unit entrance door. All such provisions shall conform to relevant requirements of the United States Postal Service as stated in "Apartment House Mail Receptacles, Regulations and Manufacturing Standards" Publication 17, April 1982. Mail handling facilities shall be in sound and secure condition with doors, where provided, fitting tightly and securely. Gang type mailboxes shall be fitted with 5 pin tumbler cylinder locks. Locks shall work efficiently. Mail slots in dwelling unit entrance doors shall be tight fitting and weather-resistant. When new dwelling unit doors are provided, they shall not have mail slots except in projects where exterior unit mailboxes cannot be used due to security problems.

2-4. GARBAGE COLLECTION. Waste material shall be stored and removed from the premises in a clean and sanitary manner, based on the common practice within the community for residential projects of similar design and construction.

a. Interior Collection Areas. Interior collection areas shall be located in spaces designed for that purpose and shall have a door separating the area from public spaces. Incinerator chutes shall not open directly into public areas, i.e., they shall open into a service area for that purpose. Collection areas containing flue-fed incinerators shall be a minimum of 20 sq. ft.

b. Exterior Collection Areas. Collection area enclosures and surfaces shall be of materials that are easy to clean and maintain in a sanitary condition. Central garbage can and dumpster collection areas shall be paved and sufficiently sloped to allow drainage of rain water and snow onto appropriate surfaces. Enclosures, fencing and screening shall be in sound condition, stable and adequately anchored.

(1) Location. Garbage collection areas, dumpsters and garbage cans shall be accessible to collection vehicles.

(2) Collection Area Definition and Screening. Collection areas shall be defined and screened from resident areas of multi-family buildings. Concrete pads for garbage cans shall have a 1 ft. high galvanized railing or other equivalent on 3 sides to keep the cans on the pad. Exterior incinerators and compactors shall be in screened locations to minimize potential problems from noise, air pollution, potential fire hazards or unauthorized access. Screening may be provided by wooden fencing or vegetation. Chain link fencing may be used only if paired with plantings.

NOTE: The location of dumpsters or other collection containers in open areas of parking lots or other areas without adequate confinement is not acceptable.

2-5. INFESTATION CONTROL. Any condition at project sites or buildings that is conducive to the thriving of infestation shall be corrected. Pest control systems for the removal or prevention of infestation shall not be injurious to human health.

a. Rodent Protection. Openings or penetrations through

foundations or walls near or below grade shall be eliminated by appropriate means, such as masonry, cement, mortar, corrosion-resistant sheet metal or wire mesh with maximum openings of 1/4 inch. Wood shall not be used. Operable basement windows shall be provided with rodent-proof shields, storm/screen windows or other forms of protections. Junctions of ducts or pipes with walls or floors shall have securely anchored collars.

b. Termite Protection. In regions subject to termite infestation, all wood framing, furring, and interior and exterior trim should be free of infestation and protected from infestation. The following shall be provided as needed:

(1) Ventilation of structural and foundation spaces;

(2) Vapor barriers (retarders);

(3) Clearances between all wood members and the ground; and

(4) Chemical treatment.

For further technical requirements on termite control, see HUD Handbook 4075.1, Inspection of Termites and Decay-Inspection Guide. Note that metal termite shields should not be used due to difficulty of installation, cost and questionable effectiveness.

2-6. LAUNDRY FACILITIES. Laundry facilities shall be provided on the project site or, when nearby public laundries are adequate and available for tenant use, these facilities may be accepted as satisfying this standard.

a. Project Facilities.

(1) Lighting. Permanent vandal-resistant lighting fixture(s) shall be provided in all common laundry facilities. Where necessary, lighting shall have locked switching mechanisms accessible to authorized personnel only. For technical requirements for lighting, see paragraph 7-4.

(2) Security. Access to and use of laundry facilities shall be safe and resistant to misuse and abuse. For technical security requirements, see paragraphs 9-7 and 10-7.

b. Laundry Equipment. Where provided, the number of washing machines shall be determined by tenant need and use. Power shall be supplied to all appliances from appropriate convenience outlets no more than 6 sq. ft

from the machines. Washing machines and clothes dryers shall be operable, and in safe, sound and sanitary condition. Generally, the number should be a minimum of: 1 washing machine for every 40 dwelling units in projects with greater than 500 units; 1 washing machine for every 35 dwelling units in smaller projects; the equivalent of one single-load dryer for every washing machine. Where new laundry equipment is provided:

(1) Provide a minimum of 3 sq. ft. of clear floor area for every 1 sq. ft. occupied by a machine;

(2) Ensure that equipment has the highest Energy Efficiency Rating (EER) made by the manufacturer when cost-effective;

(3) Consider energy conservation measures, such as scheduling of operation of laundry facilities during non-peak electrical demand periods and using cold water rinse cycles in all new machines; and

(4) Install safety pans or other overflow control systems for all washing machines located above the first floor.

c. Furnishings. Tables for folding clothes shall be furnished where space permits.

2-7. MANAGEMENT/MAINTENANCE FACILITIES. Management/maintenance facilities shall be on project sites, unless combined with facilities at other nearby projects or in a centralized facility. Management/maintenance buildings and spaces shall be in safe and sound condition. These facilities shall provide the following:

a. Physical maintenance of the project;

b. Administrative functions and services;

c. Surveillance for project security;

d. Tenant activity review;

e. General supervision; and

f. Storage for maintenance equipment.

2-8. COMMUNITY SERVICES FACILITIES. There are no mandatory standards for community facilities. See paragraph 2-8B for requirements for components within the community facilities, where provided.

2-9. RESERVED.

SECTION 2: PROJECT SPECIFIC STANDARDS

Section 1 dealt with mandatory standards for six services. In addition to these, the following services, when needed and justified, and approved by HUD, may be provided for community services, child care facilities, health care facilities and commercial facilities. Redesign of facilities may be justified on the basis of current and projected needs including security.

2-2B. RESERVED.

2-3B. MAIL HANDLING AND DELIVERY. Where necessary, central mail handling facilities may be provided with the following security features:

a. Safe Location. Visibility from adjacent public areas may be accomplished by transparent panels or wide-angle vandal-resistant surveillance mirrors.

b. Controlled Access. This is by locating mail facilities within a locked vestibule or special allocation area.

c. Vandal-Resistant Mailboxes. These have the following features:

(1) Mailbox bank installation flush with wall;

(2) 16 gauge metal construction in exposed panels (corrugated surface for additional strength, where applicable); or

(3) Double dead-lock with a minimum of 6 pins and hidden hinges for rear loading mailboxes.

d. Lighting. Permanent 24-hour lighting with vandal-resistant fixtures. For technical requirements for lighting, see paragraph 7-4.

2-4B. GARBAGE COLLECTION. If facilities are to be constructed, then procedures and specifications of the garbage removal system should he reviewed by project management.

a. Reserved.

b. Exterior Collection Areas.

(1) Where new dumpster collection areas are provided, they should be positioned for easy access by collection vehicles, which is approximately 45 degrees off the vehicular circulation path. Dumpster pads should be 4 ft. larger than the dumpster on all sides. The

paving surface where the wheels of the truck rest shall be reinforced as appropriate or thickened.

(2) Where new garbage can racks are provided, they should be a minimum of 8 inches high above the ground. They may be provided at individual dwelling unit collections areas for improved sanitation. In common collection areas, enclosures may be used.

(3) Where feasible, garbage collection areas should be a maximum of 150 ft from dwelling units in 1 and 2 family buildings and not more than 250 ft from dwelling units in multifamily buildings.

2-5B. RESERVED.

2-6B. LAUNDRY FACILITIES.

a. Security. In locations where abuse has been a recurrent problem, the following steps may be taken.

(1) Relocation of laundries to areas where there is management or tenant surveillance, such as:

(a) Within or adjacent to community or management facilities;

(b) Adjacent to elevator lobbies, mail rooms or heavily trafficked circulation paths; or

(c) Adjacent to play areas.

NOTE: New locations accessible only by stairs are not acceptable.

(2) Provision of one supervised central location where surveillance of numerous laundry facilities is not possible;

NOTE: The inconvenience of distance is outweighed by the ability to better control and maintain central facilities.

(3) Making space within the laundry room visible from the adjacent public area by a transparent panel or vandal-resistant wide-angle surveillance mirrors;

(4) Compliance of doors and windows with maximum security requirements established in paragraphs 9-7 and 10-7; or

(5) Use of tokens or pre-purchased cards in lieu of money for washing machines and clothes dryers.

b. Reserved.

c. Furnishings. Public laundry facilities may have seating and folding tables for tenant use. Where necessary, furnishings shall be secured to walls or floors. Furnishings shall be in safe and sound condition, stable and properly anchored as required. Furnishings shall be free of splintering, rust or other material deterioration.

d. Washing Machines. In projects where central laundry facilities are not provided, space, power supply, and water and waste piping (or laundry sink) may be provided in each dwelling unit. An electrical outlet should be within 6 ft. of the space provided.

e. Clothes Dryers. In Projects where clothes drying facilities are not Provided, hook-ups for clothes dryers may be installed in each dwelling unit. When hook-ups are provided, electrical supply and venting should be provided. See Paragraph 7-3 for technical requirements.

2-7B. MANAGEMENT/MAINTENANCE FACILITIES. Where new or additional management/ maintenance facilities are provided, the following guidelines shall be used for maximum total space allocation including supplies and equipment.

a. Management Facility Space Allocation.

Number of dwelling units served	Maximum Space allocation (sq. ft.)
0 - 15	150
16 - 50	325
51 - 100	500
101 - 150	600
151 - 200	775
201 - 300	1000
301 - 400	1200
401 - 500	1400

b. Maintenance Facility Space Allocation.

Number of dwelling units served	Maximum Space allocation (sq. ft.)
0 - 15	175
16 - 50	400
51 - 100	800
101 - 150	1000
151 - 200	1400
201 - 300	1900
301 - 400	2300
401 - 500	2700

c. Equipment. Nonexpendable equipment may be provided to operate any given management/maintenance facility. Equipment shall be in sound condition and shall not present a hazard. Secured storage shall be provided for supplies and equipment needed for project maintenance and operation.

2-8B. COMMUNITY SERVICES FACILITIES. The need for these facilities where space requirements are within permissible allowances shall be fully justified. This justification shall address the amount of space being requested, use of space, cost of providing facility (development costs), organization or group who will operate facility, daily operational hours, and estimated annual cost to the PHA (operating costs).

a. Requirements:

(1) Where provided, access to community services and related site and interior spaces shall be sanitary, safe and secured. For technical security requirements for these facilities, see paragraphs 9-7 and 10-7.

(2) Where facilities are also open to non-residents, they should be accessible from an outdoor space without drawing non-residents through the project's grounds. Wherever possible, provisions should be made to prevent access by non-resident users to either tenant lobbies or units, such as via elevators. However, facilities must be for the primary use of tenants.

b. Maximum Space Allowance. When new or additional community facilities are provided, the following maximum space allocation guidelines shall be used:

(1) For elderly housing, general purpose community space shall not exceed:

Number of dwelling units served	Maximum space allowance
Under 51	25 sq. ft. per dwelling unit.
51 to 100	1,250 sq. ft. plus 20 sq. ft. for every dwelling unit over 50.
101 or more	2,250 sq. ft. plus I5 sq. ft. for every dwelling unit over 100.

(2) For family housing, general purpose community space shall not exceed:

Number of dwelling units served	Maximum space allowance
Under 100	8 sq. ft. per bedroom.
100 or more	800 sq. ft. plus 4 sq. ft. for every bedroom over 100.

NOTE: For non-elderly housing, part of the maximum area as stated above for general purpose space may be used to supply space for health clinics or other preventive health programs (not in excess of 5 sq. ft. for each dwelling unit served). For further requirements, see paragraphs 2-7 and 2-8.

c. Equipment. Nonexpendable equipment may be provided to operate a community facility. Equipment shall be in sound condition and shall not present a hazard.

d. Facilities for the Elderly. Social and recreational facilities may be provided as determined by current HUD policy and tenant need. A minimum of one of each type of community facility provided for the elderly shall be accessible to the handicapped from residential, site, and transportation areas. Provisions may be made for food

preparation, serving and clean-up. Equipment and appliances shall comply with standards established in paragraph 5-3. Toilet facilities for men and for women shall be provided adjacent to these facilities and shall be accessible to the physically disabled.

e. Public Restrooms. Existing public restrooms shall have natural or mechanical ventilation. For technical requirements for ventilation, see paragraph 6-5. Access to and use of public restrooms shall be safe. In locations where abuse has been a problem, a vandal-resistant wide-angle surveillance mirror may be provided at restroom entrances. New, or when renovated, public restrooms shall be accessible to the handicapped as determined by current HUD regulations.

(1) Lighting. When necessary, permanent vandal-resistant lighting may be provided by a grounded wall-switch controlled fixture. As required, lighting may have locked switching mechanisms accessible to authorized personnel only. For technical requirements for lighting, see paragraph 7-4.

(2) Lavatories. Lavatories shall be in safe and sanitary condition, adequately anchored, and supplied with hot and cold water with adequate pressure. Units shall be free of cracks, holes or material deterioration, and shall be equipped with any of the following energy conservation devices that are cost-effective:

- Water saving devices; or

- o Faucet flow restrictors.

New lavatories should have the following features:

- o Water saving devices;
- o Outlet devices that limit hot water flow to 0.5 gpm; or
- o Self-closing valves that limit delivery of hot water to a maximum of 0.25 gal.

(3) Toilets and Urinals. Where provided, toilets and urinals shall be in safe and sanitary condition, adequately anchored and free of cracks, holes or material deterioration. Toilets and urinals shall be retrofitted with water saving devices that are cost-effective. New toilets should be coverless with plastic split seats for greater sanitation, decreased maintenance and increased durability.

(4) Toilet Compartments and Urinal Partitions. Partitions should be provided between toilets. Toilet Partitions shall be in safe and sanitary condition, stable, adequately anchored, and have operable doors and hardware. When Provided, new toilet and urinal partitions should be constructed of baked enamel metal panels, and should have a securely anchored coat/package hook on an interior wall or on the door. Doors, whenever possible, should swing out.

(5) Restroom Accessories. Public restrooms should have the following items:

- o Permanent soap dispensers;
- o Permanent dispensers for paper or cloth towels; or electric hand dryer;
- o Permanent toilet paper holders or dispensers;
- o Waste receptacles; and
- o Stainless steel mirrors.

Required accessories shall be in sound and sanitary condition, securely anchored to supports, and free of splintering, rust, broken glass or material deterioration. Whenever possible, new accessories should be flush-mounted stainless steel units. Glass should not be used. Anchorage should be resistant to abuse. Double tissue dispensers may be used in lieu of single units to minimize supply depletion and reduce tending time by maintenance personnel.

f. Child Care Facilities. Space may be provided for a child care center for tenants if such a facility is not otherwise available in the community or when existing facilities are inadequate for current needs. This space may be in addition

to the amount allowed for community facilities in subparagraph b(2). This space shall not include accommodation for formal education programs normally provided by the local school system. If child care facilities are needed, the PHA shall provide written evidence from a qualified local agency indicating that the agency agrees to furnish, equip, operate and maintain the facility as well as provide insurance coverage.

g. Health Care Facilities. For elderly projects, space may be provided for preventive health programs. Space may be allocated for examination rooms and health clinics only if they are not available in the neighborhood, but shall not include general medical care or hospital care facilities such as laboratory and treatment rooms. When health care facilities are provided, a maximum of 5 sq. ft. per dwelling unit may be provided. This space may be in addition to the amount allowed for community facilities in subparagraph b. If health care facilities are needed, the PHA shall provide written evidence from a qualified local agency indicating that the agency agrees to furnish, equip, operate and maintain the proposed facility, as well as provide insurance coverage, and identifying the services to be provided.

h. Commercial Facilities. Commercial facilities, such as space for a general, grocery or drug store, may be provided only when there is no other practical alternative to meet the needs of tenants.

2-9B. TENANT STORAGE SPACE. Tenants may be provided with storage for bulk items such as carriages, luggage and boxes when these items cannot be conveniently stored in dwelling units. Storage areas should not be located in secluded or unsupervised areas that make access or use unsafe. Tenant storage areas not located within the dwelling unit should be secured with individual locking mechanisms that are resistant to abuse.

Access to storage rooms shall be possible by authorized tenant or management personnel only. Where new facilities are provided, they should be in locations subject to management or tenant surveillance and adjacent to heavily trafficked areas. Storage system materials and the manner in which items are stored shall comply with relevant fire codes and shall not create potentially hazardous conditions.

CHAPTER 3. SITE

PERFORMANCE OBJECTIVES

3-1. GENERAL. Project sites shall be consistent with the MPS and provide a safe, functional and attractive living environment for tenants as follows:

a. Emergency and standard access to all buildings and site activities;

b. Safe access to and use for the project site that discourages abuse directed towards people and property;

c. An environment free from potential hazards to health and safety;

d. Site definition to establish a residential quality throughout the project; and

e. Incorporation of energy conservation measures where appropriate and cost-efficient.

SECTION 1: MANDATORY STANDARDS

3-2. VEHICULAR ACCESS. Permanent public (dedicated) or PHA-owned or private vehicular access shall be provided to the project site and to buildings as required. Where PHA-owned, this access shall have a paved (in urban areas) or all-weather surface (in rural areas). For technical requirements for paving, see paragraph 10-4. The use of private streets for this purpose shall be protected by a permanent easement.

a. Emergency Access. Fire protection and health emergency vehicles and equipment shall have access over roads or across site to buildings.

b. Road Separation. Wheel stops or other appropriate barriers shall be provided to prevent vehicular encroachment beyond driveways and service areas; however, these methods of road confinement shall not prevent access by emergency vehicles.

3-3. PEDESTRIAN ACCESS. Permanent walks and paths shall be provided for safe and convenient all-weather circulation throughout the project site. Where need for pedestrian access exists, paved access shall be provided to all residential buildings, community facilities, site developments, and service entrances. When new or replacement walks are installed, project walks shall be provided with adequate radius at intersection of walks to avoid pedestrian wear when corners are cut. Widths of new walks shall accommodate pedestrian traffic so that adjacent lawns, vegetation or fencing are not abused. New principal entrance walks shall be a maximum of 6 ft. wide for high-rise

buildings and 4 ft. wide for low-rise buildings. New minor and service walks shall be a minimum of 3 ft. wide. Existing walks shall not be removed to comply with this standard when they are in good condition, can be economically repaired or are adequately serving their intended function.

3-4. PARKING FACILITIES.

a. Safety. For safety or visual or acoustic separation as required, wheel stops or other appropriate barriers shall be provided and suitably placed to prevent unwanted vehicular encroachment beyond parking area limits.

b. Location. On-site and adjacent off-site public parking shall be conveniently located, and shall not be located in secluded or unsafe areas. Public street parking where permitted shall be counted, as appropriate, to minimize the extent of expanded parking area on site. Where new parking spaces are provided, whenever possible, the maximum walking distance from the new parking spaces to a public entrance of buildings should take into account the intended use of follows:

(1) 250 ft. for non-elderly tenant parking; and

(2) 150 ft. for elderly tenant parking.

c. Garages and Carports. New garages and carports may be provided only when required by local building codes or ordinances for existing buildings. Repair and replacement may be provided, as needed, for existing carports and garages.

d. Lighting. Permanent night lighting shall be provided at all collective parking areas and access paths to and from these areas to dwelling units and community facilities. New site lighting shall be mounted on existing buildings or existing utility poles to the extent feasible. Underground wiring shall not be installed unless required by local code.

3-5. HEALTH AND SAFETY. Existing site and adjacent features shall not contain potentially hazardous conditions. Project sites and buildings shall be free of excessive air pollution and noise caused by on site conditions.

a. Dumping. No portion of the project site shall be used for dumping.

b. Infestation Control. The project site and structures shall be effectively protected against infestation from rodents, termites or other vermin. For technical requirements, see paragraph 2-5.

c. Vacant Structures. Abandoned nondwelling structures

serving no useful purpose or in a deteriorating condition shall be secured or demolished in accordance with HUD regulations.

d. Lead-Based Paint. See paragraph 10-6a.

3-6. SITE SANITATION. Waste receptacles shall be provided throughout the project site.

3-7. SITE DEFINITION. Project site boundaries shall be defined to deter trespassing. Sites that border on industrial, commercial or sanitation activities shall be permanently screened. For technical requirements, see paragraphs 10-3 and 10-5.

3-8. SITE DEVELOPMENT. Large open spaces that cannot be maintained or supervised shall be developed, reallocated, redeveloped or disposed of through appropriate sales procedures required under HUD regulations and the Annual Contributions Contract.

3-9. GRADING AND DRAINAGE. Grading and drainage shall provide for immediate diversion of water away from buildings, paved surfaces and recreation areas, and disposal from the site, by methods of disposal that shall not create unsafe conditions or severely limit use of outdoor areas.

3-10. RECREATION. Outdoor recreation space for children and adults shall be provided subject to availability of land, at family project sites including adult recreation and tot lots. Suitable outside areas for active and passive recreational activities for elderly tenants shall be provided at elderly projects and, as needed, at family projects.

NOTE: Nearby publicly owned and maintained parks, playgrounds, and school play areas that are readily available for use by project tenants may be considered to fulfill the required recreation areas for adults and children over the age of 5 years. Tot lots for children younger than 5 must still be provided on-site, unless the public park is close to the project without barriers to safe access. Surfaced area to accommodate organized and unorganized games shall be provided for each project.

a. Location of Play Areas. Play and sports areas shall not be located in secluded or unsafe areas or too close to dwelling areas to prevent disturbing tenants in neighboring units by the noise.

b. Play Area Definition. Play areas shall have sufficient barriers from streets, trafficked areas, or other hazardous areas that are unsafe or prevent enjoyable use of the areas.

c. Play Equipment. Moving equipment such as swings and slides shall be located and arranged where they do not cause injury to playground participants or interfere with circulation past the area. Equipment shall be in good condition, safe to operate, and free of conditions hazardous to the health and safety of the users.

d. Outdoor Seating. Existing outdoor seating shall be stable, have properly anchored members and be free of splintering, rust or deterioration.

3-11. RESERVED.

SECTION 2: PROJECT SPECIFIC STANDARDS

3-2B. VEHICULAR ACCESS.

a. Reserved.

b. Road Separation. When needed for tenant safety and security, roads adjacent to or through the project site may be separated from pedestrian areas by sturdy barriers, such as fencing, railings, etc., or land areas. For technical requirements for fencing, etc., see paragraph 10-5. Since noise may be associated with the use of roads, especially high speed roads, the requirements of HUD's noise abatement regulations (24 CFR Part 50) shall be considered concurrently.

3-3B. PEDESTRIAN ACCESS.

a. Security. Where security is a problem, walks from public streets may be provided with greater illumination. Whenever possible, locate new walks in locations that are easily surveyed from a trafficked street or project building. For technical requirements for paving, see paragraph 10-4.

b. Circulation. Pedestrian circulation that is unsafe or difficult to traverse due to extreme wind patterns may be protected by appropriate dividers, fencing or screening. For technical requirements, see paragraph 10-5.

c. Safety. Exterior site handrails may be provided as required for greater ease of movement by the handicapped or the elderly.

3-4B. PARKING FACILITIES. Where replacement or additional space is needed, the amount of parking shall not exceed that required by local code. In the absence of applicable code, the amount of parking should be adequate for residents, guests, staff and service vehicles, but shall not exceed one vehicular space per unit.

a. Vandalism. When vandalism within parking areas has been a recurrent problem, unauthorized access to parking areas may be limited by enclosing the area and assigning parking spaces to individual tenants. Appropriate signage may be installed for reinforcement of assignment.

NOTE: Parking areas that are visable from dwelling units or highly trafficked areas have natural surveillance.

b. Surveillance. Site spaces between parking areas and dwelling units may be developed for needed recreation to increase natural surveillance while providing amenities for tenants.

3-5B. RESERVED.

3-6B. RESERVED.

3-7B. SITE DEFINITION. Fencing, vegetation, berming, level change or other forms of definition may be used as physical or symbolic site definitions or barriers. Use of symbolic barriers may indicate to entrants that they are crossing into a supervised area.

3-8B. SITE DEVELOPMENT.

a. Open space. When requiring definition or reallocation, open space may be developed for security as follows:

(1) Fencing, vegetation or raising or lowering of the elevation of land may be used to cluster buildings such as for the establishment of a single common entry point to increase security.

(2) Unused outdoor space may be enclosed to create communal yards for low-rise buildings and semi-public recreation spaces for larger and high-rise buildings. Where possible, access to shared outdoor tenant spaces should be through dwelling units or semi-private spaces only.

NOTE: These enclosures will create zones of influence that will encourage residents to use and supervise the area, and feel greater responsibility and identity for the area. Tenant surveillance may deter crime.

(3) Private and semi-private front or back yards may be created for low-rise or first floor dwelling units that will provide outdoor recreation space, limit accessibility to dwelling unit windows and doors, and provide a transition or buffer area between private and public spaces.

(4) Large projects without interior streets may be

subdivided by streets, where necessary, for greater security. The provision of through-streets may provide the following:

(a) A measure of safety resulting from the increased activity, by bringing vehicular and pedestrian traffic into the project;

(b) Easier patrolling and access by police or security personnel; and

(c) Easier and more direct access to buildings and site activities.

b. Energy Conservation. All new site development, including structures, fencing, walls, vegetation and berming, may be considered from an energy conservation point of view. Deflection of prevailing winds, summer shading of windows and other glazed areas, protection of entrances from winter wind penetration and utilization of solar radiation in winter may be considered.

3-9B. RESERVED.

3-10B. RECREATION. Sitting areas may be provided for in family and elderly projects, such as adjacent to building entrances, community facilities, major circulation paths and children's play areas.

a. Use of Local Streets. When additional play space for children cannot be provided at the project site to comply with the mandatory standards, local streets may be closed for this purpose when relevant zoning and codes permit with the approval of the local government.

b. Multiple Playgrounds. More than one playground may be provided at a project site, for a variety of play experiences. Select equipment that is appropriate for the age groups to be served.

3-11B. LIGHTING. There are no mandatory requirements to light recreational facilities; however, night lighting may be provided for sports and play areas. Night lighting for playgrounds provides recreational amenities while potentially increasing site security by increased activity and visual exposure. Where night lighting is provided, it shall meet standards established in paragraph 7-5. Where it is impossible to provide adequate lighting from existing poles and buildings, new poles may be considered if safety or security is at issue.

CHAPTER 4. BUILDING ENTRANCE AND CIRCULATION

PERFORMANCE OBJECTIVES

4-1. GENERAL. Public spaces for building entrance and circulation within residential and community buildings shall be consistent with the MPS and provide for the following:

a. Safe building entrances;

b. Vertical and horizontal circulation throughout the building and access to all interior residential and community facilities; and

c. Safe, unobstructed and direct fire egress in compliance with relevant fire codes.

CHAPTER 4. BUILDING ENTRANCE AND CIRCULATION

SECTION 1: MANDATORY STANDARDS

4-2. PUBLIC SPACES.

a. Lighting. When replacement lighting is needed, permanent ceiling or wall-mounted lighting fixtures shall be provided in all public interior spaces for safe and convenient use. For technical requirements, see paragraph 7-4

b. Waste Receptacles. Interior public spaces shall have a sufficient number of waste receptacles to keep spaces free of litter.

c. Reserved.

4-3. BUILDING ENTRANCES AND LOBBIES.

a. Building Entrances. Building entrances shall be accessible from a paved path from both parking areas and public transportation drop-offs where these paths are on PHA property. In suburban or rural areas, the paths to public transportation drop-offs shall be consistent with the type of all-weather surfaces normally provided. The junction point between path and building entrance shall have a platform (which may be the same height as the sidewalk). Building entrances shall be clearly defined by interior and exterior lighting, signs, and entrance area and path definition as required.

b. Lobbies. Lobbies or entrance vestibules shall be in safe and sound condition, structurally stable, and anchored as required. Roofs shall not leak and shall be drained. For technical requirements, see Chapter 9. Vestibules may be provided when determined to be cost-effective in terms of energy conservation.

c. Reserved.

4-4. HALLS AND CORRIDORS. Halls and corridors shall provide safe circulation between dwelling units, between dwelling units and other spaces, and to various means of exit. Corridors used as a mean of fire egress shall Provide a continuous and unobstructed means of travel from any point in a building to a public way or the building exterior.

4-5. STAIRWAYS.

a. Stairways. Interior public stairways shall provide for safe ascent and descent of persons under normal and emergency conditions. Stairways used for required fire egress shall comply with the NEPA 101 Life Safety Code and all other relevant codes. For technical requirements for fire protection, see paragraph 2-2. Stair structure, treads and risers shall be in sound condition, properly supported and anchored, and capable of supporting anticipated loads. Structure and finish materials shall be free of splintering, rust or other material deterioration. Stair treads shall have non-slip surfaces.

b. Handrails. Stairways shall have a minimum of one continuous handrail mounted between 30 inches and 36 inches above the floor or tread. Stairways wider than 44 inches shall have handrails on both sides, and those wider than 88 inches shall additionally have an intermediate handrail at the stair center. Handrails shall be in sound condition, secured and capable of supporting anticipated loads. Handrails shall be free of splintering, rust or other material deterioration.

SECTION 2: PROJECT SPECIFIC STANDARDS

4-2B. PUBLIC SPACES.

a. Lighting. Where light bulbs are frequently removed or abused, special locking systems requiring special tools, left hand bulbs, vandal proof fixtures or key switches should be considered.

b. Reserved.

c. Security. Hidden and unused spaces adjacent to or part of corridors, stairways or other interior public spaces that are potential hiding places for criminals or vandals may be eliminated by the construction of walls. This includes unused lobby or vestibule space, and alcoves adjacent to corridors, stairs and other public spaces. Where this is not possible, vandal-resistant wide-angle

surveillance mirrors may be provided.

4-3B. BUILDING ENTRANCES AND LOBBIES.

a. Reserved.

b. Lobbies. Entrances vestibules may be provided where justified for security reasons. Where provided, the interior of new entrance vestibules should be visible from the outer entrance. Multi-family building vestibules should be glazed with tempered glass to provide visibility. Single unit vestibules should have a door with a vision panel or equivalent safety glazing for this purpose.

c. Security. New building entrances may be designed to control the entrance of unauthorized persons, as well as create an environment that deters crime and vandalism.

(1) Security Systems. Where necessary, building entrances may have controlled key entry systems as determined in paragraph lO-7B(g) or any of the following surveillance systems:

(a) Buzzer intercom systems;

(b) Telephone intercom systems;

(c) Audio surveillance of elevators by tenants;

(d) Tenant-monitored televisions on unused standard television channels; or

(e) Video surveillance of lobbies, elevators and adjacent play and parking areas.

Note: Before installation of new security systems, reasons for the failure of any previous systems should be reviewed. Tenant representatives should be involved in the review of previous, existing and new systems.

(2) Consolidated Entrance. Buildings with more than one exit that can be consolidated into one central entrance/exit may be altered provided all relevant fire codes can be met.

(3) Visibility into Entrance Lobbies. Persons about to enter lobby or vestibule spaces should be able to see interior entrance spaces prior to entry, through door and window glazing or relevant surveillance systems. Required lighting should illuminate the exterior building entrance and the lobby. Elevator lobbies should be visible directly from the public entrance or by wall or ceiling mounted wide-angle

surveillance mirrors made of vandal-resistant materials.

4-4B. RESERVED.

4-5B. STAIRWAYS. When interior stairways are continually vandalized and are the location of crime, the following may be implemented:

a. Increase glazing and visibility on enclosure walls and walls facing public areas;

b. If the stairway is used only for emergency exit, install self-locking stair hall doors to prevent reentry from stair; or

c. Replace interior stair with exterior stair for increased visibility and surveillance.

CHAPTER 5. DWELLING UNITS

PERFORMANCE OBJECTIVES

5-1 GENERAL. Modernization done in dwelling units shall be consistent with the MPS, and provide safe, secure, healthful and attractive environments for tenants including:

a. Residential facilities and utilities;

b. Protection from fire, accident, structural and health hazards;

c. Security from forcible entry;

d. Spaces sized and arranged for comfortable and convenient use; and

e. Privacy from exterior noise, adjacent dwelling units and public spaces.

7485.2 REV-1 CHG 2

CHAPTER 5. DWELLING UNITS

SECTION 1: MANDATORY STANDARDS

5-2. ENTRANCE, LIVING AND DINING AREAS. Each dwelling unit shall have standard unit entry, general family living, interior recreation and dining. Dwelling unit entrances shall be free from drafts and/or water penetration. For technical requirements, see Chapter 9.

NOTE: Dining area may be provided in either the kitchen area or the general living area.

5-3. KITCHENS. Each dwelling unit shall have a specific kitchen space for food preparation, serving and after-meal clean-up.

a. Sinks. Each dwelling unit shall be provided with a kitchen sink with water-proof backsplash. Sinks shall be in safe and sanitary condition, anchored and free of cracks, holes or material deterioration. Sinks shall be supplied with hot and cold water. Existing sinks

shall be retrofitted with energy conservation devices that are cost-effective, such as:

- Water saving devices; or
- Faucet flow restrictors.

When new sinks are provided, they should have the following features:

- Stainless steel basin;
- Single faucet washerless controls;
- Continuous and preformed backsplashes and edging;
- Basket strainer; and
- Hot water flow limited to .5 gpm; maximum 3 gpm total flow.

b. Stove/Ovens. When provided by the PHA, it shall be a free-standing four-burner stove and oven with a non-flamable wainscot on all sides of abutting vertical surfaces in each dwelling unit. Where a stove is not provided, there shall be a 36 inch wide space and adequate utility supply. PHA-provided stove/ovens

shall be in safe and sanitary condition, have operable pilots and controls, and be free of any gas leakage. Ranges located under wall cabinets shall be fitted with either a range hood or a metal protector. The metal protector shall be comprised of a minimum of 1/4 inch asbestos millboard or any other material with equal or higher properties of fire resistance and heat absorbance, covered with a minimum 28 gauge sheet metal. When range hoods are provided, they shall be anchored securely to the wall and be a maximum of 30 inches above the range top. New stoves and ovens shall have pilotless operation.

c. Refrigerators. If provided by the PHA, each dwelling unit shall have a refrigerator with a freezer. Where a refrigerator is not provided by the PHA, there shall be a 36 inch wide space and adequate utility supply provided to the unit. This space shall be within 6 ft. of a grounded outlet. PHA-provided refrigerators shall be operable, in safe and sanitary condition and free of any refrigerant leaks.

d. Food and Equipment Storage. Each dwelling unit shall be provided with storage cabinets for food and equipment. Storage cabinets and units shall be in sound and

sanitary condition. New or replacement kitchen cabinets may be provided at the discretion of the PHA, if needed.

(1) Hardware. Hardware shall be secured in place and operable. When replacing existing storage units, hardware and anchoring systems, the material should be chosen for maximum durability under intense use. Cabinet materials shall be in accordance with the requirements of ANSI A161.1 "Minimum Construction Performance Standards for Kitchen Cabinets."

(2) Cabinets Mounted Above Stoves. Metal or unprotected wood cabinets mounted above stoves shall have a minimum clearance of 30 inches. The clearance may be reduced to 24 inches when the underside is protected with a fire-resistant material meeting the relevant fire codes.

e. Counter Work Space. Each dwelling unit shall have countertop surfaces constructed of materials that are

easily cleaned, are waterproof and will withstand frequent cleaning. Surfaces shall be plastic laminate that is securely bonded to a 5/8 inch water resistant plywood or particle board core. Countertops shall have water proof backsplashes on all sides abutting vertical surfaces. New back and endsplashes shall be covered with plastic laminate. Dwelling units with less than two bedrooms shall be provided with a minimum of 30 inches of continuous counter space. Two-, three- and four-bedroom units shall have a minimum of 36 inches of continuous counter space. Larger units shall have a minimum of 42 inches. Countertops shall be in sound and sanitary condition, free of holes, cracks, water penetration or material deterioration. Joints abutting vertical surfaces shall be tight and sealed;

NOTE: If kitchens are substantially rehabilitated and only where existing space permits, counter space shall be provided as outlined in the HUD Minimum Property Standards handbook 4910.1. In all cases, provision of counter area is dependent on available, existing space. Walls shall not be moved to meet the requirements in "e" above.

5-4. BATHROOMS. Each dwelling unit shall have sanitary and bathing

facilities that may be used with privacy. Access to the bathroom should not be through a habitable room, except in one-bedroom and efficiency units.

a. Lavatories. Each dwelling unit shall have a lavatory. Lavatories shall be in safe and sanitary condition, anchored, free of cracks, holes or material deterioration. Lavatories shall be supplied with hot and cold water.

   (1) Existing Lavatories. They shall be retrofitted with energy conservation devices that are cost-effective, such as:

       o Water saving devices; or
       o Faucet flow restrictors.

   (2) New lavatories. Where provided new, they shall have the following features:

       o Porcelain on steel or cast construction;
       o Single faucet washerless controls

       o Continuous and preformed backsplashes and edging;
       o Mechanical waste fitting; and
       o Devices that limit hot water flow to recommended .5 gpm; maximum 3 gpm total flow.

b. Toilets. Each dwelling unit shall have a toilet located within the primary bathroom of the dwelling unit. Toilets shall be operable, in safe and sanitary condition, adequately anchored, free of cracks, holes or material deterioration, and supplied with water at adequate pressure. Toilets shall be retrofitted with water saving devices that are cost-effective.

c. Bathing Facilities. Each dwelling unit shall have a permanent bathtub or recessed shower with all adjacent walls adequately protected from water damage. Bathtub or shower bottom surfaces shall have slip-resistant surfaces. For technical requirements for wall and floor finishes, see paragraph 10-6. Bathtubs or showers shall be in sound and sanitary condition, stable and adequately anchored, and free of cracks, holes, or material deterioration. Abutment and adjoining surfaces shall be sealed and caulked. Units shall be supplied

with hot and cold water with adequate pressure. Showers shall be retrofitted with energy conservation devices that are cost-effective, such as:

o Water saving devices; or
o Flow restrictors for shower heads.

NOTE: Free-standing metal or plastic showers are not acceptable and must be replaced.

(1) New Bathtubs. These shall be porcelain enamel on steel or cast iron or constructed of fiberglass reinforced plastic. The finished product shall meet the standards set forth in Porcelain Enameled Formed Steel Plumbing Fixtures, ANSI A112.19.4.1977 and Use of Materials Bulletin No. 73, Plastic Bathtubs, Plastic Shower Stalls and Receptors. Also see paragraph 10-6d(2) for wall finishes, including shower walls.

When new bathing facilities are provided, they shall have the following features:

o Shower units mounted with the wall or hidden on the surface of the wall;

o Single lever washerless bathtub fixture and/or shower control;

o Shower faucet flow restrictors that limit water use to recommended 3 gpm maximum;

o Shower flow restrictors that limit hot water use to 3 gpm; and

o Access panels for bathtubs and showers.

(2) Selection of Bathtubs or Showers. PHA determination should be based on a cost benefit analysis that considers the expected longevity in the specific social and physical environment involved. The cost-effectiveness should reflect the serviceability, initial installation costs, repairs from cigarette burns or vandalism and longevity based on the experiences of the PHA itself as well as of other similar PHAs. In making its determination, the PHA may choose to have a flexible policy that may favor one material or system for elderly tenants and

another for families with children.

d. Bathroom Accessories. Bathrooms shall have the following accessories:

(1) Space for a tenant-provided soap dish at lavatory. When space does not exist, securely anchored walltype;

(2) Towel bar convenient to washing and bathing facilities;

(3) Toilet paper holder at toilet;

(4) Shower curtain rod or enclosure at shower;

(5) Securely anchored grab bar/soap dish at bathtub or shower; and

(6) Mirror and medicine cabinet or equivalent

enclosed storage.

Note: New soap dishes, cup holders and towel bars should be ceramic, stainless or chromed steel.

5-5. BEDROOMS. All bedrooms shall be accessible from a corridor or hallway within the dwelling unit. Access shall not be through a kitchen or other bedrooms.

5-6. STORAGE.

a. Clothes Storage. Bedrooms shall have closets for clothes storage. Closets shall have a door, accessible rod, clear space below for hanging clothes and a shelf above the rod. For technical requirements on doors, see Chapter 10.

b. General Storage. Where space permits, dwelling units shall have space for storage of items and equipment that supplements required storage in bedrooms and the kitchen.

SECTION 2: PROJECT SPECIFIC STANDARDS

5-2B. RESERVED.

5-3B. KITCHENS.

a. Reserved.

b. Reserved.

c. Reserved.

d. Food and Equipment Storage. Where existing space permits and current storage facilities have deteriorated to the degree that replacement is necessary, the following storage area allotments may be provided:

Storage Area in Sq. ft.	Number of Bedrooms				
	0	1	2	3	4+
Minimum Shelf Area	24	30	38	44	50
Minimum Drawer Area	4	6	8	10	12

NOTE:

(1) Enlarging kitchens by moving walls or partitions to fulfill the above requirements for storage is not permitted.

(2) A minimum of one-third of the required area shall be located in base or wall cabinets and a minimum of 60 percent of the required area shall be enclosed by cabinet doors.

(3) Wall cabinets above refrigerators and shelf area over 74 inches high shall not be counted as required storage.

(4) Inside corner cabinets shall be counted as 50 percent of the shelf area. When revolving shelves are used, the actual shelf area may be counted.

(5) Drawer area in excess of the required area may be counted as shelf area if drawers are at least 6 inches in depth.

5-4B. RESERVED.

5-5B. RESERVED.

5-6B. RESERVED.

CHAPTER 6. MECHANICAL SYSTEMS

PERFORMANCE OBJECTIVES

6-1. GENERAL. Mechanical systems shall be consistent with the MPS and provide project sites and buildings with the following services:

a. Proper temperatures within buildings and spaces to maintain health, comfort and system safety without excessive energy usage as defined herein;

b. Ventilation of dwelling and public spaces to maintain health and sanitary spaces;

c. Required ventilation of mechanical and structural areas to insure safe system functioning; and

d. Plumbing systems for the storage, supply, distribution and drainage of water, and sewage systems required to maintain safe and sanitary sites and buildings.

SECTION 1: MANDATORY STANDARDS

6-2. MECHANICAL EQUIPMENT

a. Operation. Mechanical equipment shall be safe and efficient to operate and durable, dependable and economical to maintain. Equipment shall operate within appropriate noise levels so as not to interfere with tenant use of buildings and spaces. Mechanical equipment shall be provided with ventilation for combustion and maintenance of safe ambient temperatures.

b. Location. Equipment, panels and mechanical rooms shall not be accessible to unauthorized personnel. Equipment not located within mechanical rooms shall be protected by vandal-resistant cages or other equivalent means. Mechanical rooms shall be provided with self-closing locks with free knobs on the inside, with access by key only. For technical requirement for doors, see paragraph 10-7. Mechanical and electrical rooms shall be separate, sole use spaces. These rooms shall not be used as passageways, storage areas or for any other purpose. Mechanical rooms and equipment shall be illuminated for safe and convenient use, inspection and maintenance.

6-3. HEATING. Heating facilities shall be provided for interior residential, community, public and utility spaces where mechanical heating is considered necessary to provide comfort and system safety.

a. Space Temperatures. Set-back thermostat controls shall be provided when cost-effective. New or replacement thermostats installed in habitable spaces shall be

factory set for a maximum temperature of no more than 75F for elderly dwelling units and 72F for non-elderly dwelling units. Thermostat controls that are to be moved should not be located in public areas (i.e., hallways, etc). Where conditions necessitate placement of thermostats in public spaces, these units shall be tamper resistant.

(1) Habitable Spaces. In family projects, the heating system for habitable spaces shall be capable of attaining 65F based upon outside design temperature. In elderly projects, the heating system for habitable spaces shall be capable of attaining 75F based upon outside design temperature.

NOTE: Dwelling unit thermostats should be inspected for proper placement. Inaccurate space temperature reading may be caused by location of thermostats on outside walls, adjacent to exterior doors, windows, or cooking areas.

(2) Non-Habitable Spaces. Maintenance, mechanical and other non-habitable spaces shall be maintained at a temperature that provides adequate working conditions and safe system functioning.

b. Space Heating Equipment. Space heating equipment shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Electric and electronic pilots;
- o Flue damper;
- o Duct heat recovery device;
- o Reduced oil nozzle size;
- o Tenant fuel metering;
- o Replacement of obsolete equipment;
- o Setback thermostat; or
- o Other.

(1) Individual Gas or Oil Heaters. Individual gas and oil heaters shall be connected to an approved vent, flue or chimney, and shall have adequate air supply for complete fuel combustion. Heaters shall be protected to prevent unsafe human contact or fires and have clearances around them. Floors beneath equipment shall be protected against fire and deterioration. Screening shall not minimize required ventilation to the space heater. When provided new or replaced, individual controls or units shall not be positioned near the floor, especially in elderly projects or in units for the handicapped.

(2) Open Flame Heaters. Open flame radiant space heaters shall not be used.

c. Central Heating Equipment. Central heating equipment shall be retrofitted with energy conservation opportunities and devices that are cost-effective, such as:

- o Flue heat recovery;
- o Insulation;
- o Turbulators;
- o Replacement of obsolete plant; or
- o Other.

d. Central Distribution Systems. All heating elements shall be protected to prevent unsafe human contact or fires. Heating distribution systems shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Individual hydronic controls;
- o Zone control;
- o Insulation of hot water and steam piping;
- o Boiler control from outdoor temperature; or
- o Other.

6-4. DOMESTIC HOT WATER.

a. Systems. Domestic hot water heater systems shall have the capacity to maintain a minimum water temperature of l00F The maximum water temperature shall not exceed l20F at the tap for typical dwelling unit use. Heaters shall be connected to an approved vent, flue or chimney and shall have adequate air supply for fuel combustion. Domestic hot water heating systems shall be with retrofitted energy conservation devices that are cost-effective, such as:

- o Jacket insulation for electric heaters;
- o Off peak control of electric water heaters;
- o Solar collector systems;
- o New high-efficiency water heater replacement; or
- o Other.

b. Equipment location. Fossil fuel fired hot water heaters shall not be located in any room used or designed to be used for sleeping purposes such as bedrooms or combined bedroom/living rooms. Gas and oil fired water heaters shall not be located in bathroom, clothes closets, under stairways, or in a confined space with access only to that

location. Heaters located in closets designed for that purpose shall be vented. Heaters shall have clearances

around them and shall be protected to prevent unsafe human contact or fires. Floors beneath equipment shall be protected against fire and deterioration.

6-5. VENTILATION. Habitable rooms, except kitchens and bathrooms, shall have natural ventilation through operable glazed openings that open directly to streets, courts or project site and not to window wells. Required opening shall be a minimum of 3 ft. from an exterior obstruction. Habitable rooms located below grade shall have required light and ventilation areas located above the level of the adjoining ground. Bathrooms, toilet compartments, kitchenettes and cooking areas may be provided with mechanical ventilation in lieu of natural ventilation. Ventilation systems shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Reducing supply/outdoor air quantities;
- o Automatic timer control; and
- o Other.

Exhaust fans in kitchens and bathrooms may be provided when required by local codes. New range hoods shall be ductless and shall use replacement filters. For technical requirements for stoves/ovens, see paragraph 5-3b.

a. Air Quantities. All spaces that require mechanical outdoor air ventilation shall have a minimum of 5 cfm/person filtered and tempered outdoor air. Outdoor air requirements shall not exceed this level unless specified.

b. Equipment and Appliances. Clothes dryers shall be vented to the building exterior or to a mechanical ventilation system. Vents, air-conditioner sleeves or other ventilation openings shall be sealed or closed-fitted to prevent excess air or water infiltration.

6-6. PLUMBING. Project site and building plumbing systems shall provide adequate water supply and distribution, drainage, sewage venting, and all required materials and fixtures to provide: maintenance of tenant health and safety and of cleanliness; disposal of human and other waste; and safe, efficient and environmentally sound site and building storm drainage.

a. Water Supply. Hot and cold water shall be supplied to all plumbing fixtures except water closets, urinals, and drinking fountains, which shall be supplied with cold water only. Water supply to plumbing fixtures shall be free of contamination. There shall not be cross connections or water inlets for fixtures below the overflow rim that could lead to back-siphonage and contamination. Temperatures above l20F shall only be provided for washing machines.

b. Plumbing Fixtures. All plumbing fixtures shall perform the function for which they were designed, as follows:

(1) Be connected to an approved water system and with sufficient supply and pressure to enable satisfactory functioning;

(2) Be vented, as required;

(3) Be fabricated of non-absorbent materials; and

(4) Be installed in locations accessible for cleaning the fixture and surrounding area to maintain sanitary conditions that will not breed infestations.

NOTE: For other requirements, see Chapter 5.

Fixtures shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Shower flow restrictors;
- o Faucet flow restrictors;
- o New "energy efficient" faucets;
- o Water savers in the water closets;
- o Hydro-pneumatic pumping; and
- o Other.

c. Sewage System. Plumbing fixtures shall be connected to an approved sewage disposal system. All parts of the sewage system shall be in proper working condition.

d. Storm Drainage. Where installed, storm drainage systems shall effectively drain water from project sites and buildings to prevent hazards to public safety and property maintenance.

6-7. RESERVED

SECTION 2: PROJECT SPECIFIC STANDARDS

6-2B. RESERVED.

6-3B. RESERVED.

6-4B. RESERVED.

6-5B. RESERVED.

6-6B. PLUMBING.

a. Water Supply. Water softening or other water treatment equipment may be provided only in areas where hard water

has produced problem scaling or clogging of supply pipes.

b. Reserved.

c. Reserved.

d. Reserved.

6-7B. COOLING.

a. Cooling with Mechanical Means. Where dwelling units or public spaces are currently cooled, the following requirements shall not be exceeded.

(1) Interior spaces shall not be cooled to less than 78F;

(2) Interior spaces shall not be dehumidified to less than 60% relative humidity;

(3) Cooling systems should be retrofitted with any of the following energy conservation devices that are cost-effective, such as:

o Ambient control;
o Insulation;
o Replace obsolete equipment; or
o Other.

(4) Spaces shall not have simultaneous cooling and heating; and

(5) Storage, mechanical and other uninhabited spaces shall not be cooled.

b. Provision of Electrical Service Outlets. Outlets as well as sleeves for tenant-owned, through-the-wall units may be installed when the project does not provide the equipment. This provision may be considered only when it is customary in the area to allow tenants in low- and moderate-income housing to install air-conditioning.

CHAPTER 7. ELECTRICITY AND LIGHTING

PERFORMANCE OBJECTIVES

7-1. GENERAL. Project sites and buildings shall be consistent with the MPS and have safe and efficient electrical systems that provide the following:

a. Safe distribution systems, equipment and related devices that are not a potential source of electrical or material combustion hazards;

b. Capacities and wiring for the safe use of public and domestic appliances as determined by current or proposed project demands;

c. Capacities of wiring for safe and efficient operation of building systems, such as mechanical system controls, ventilation fans, water pumps, and other needed equipment;

d. Illumination of sites and interior spaces for safe and secure use;

e. Continuous functioning of lighting systems;

f. Equipment that is durable, dependable and maintainable and does not create conditions hazardous to life or property; and

g. Operation with energy efficiency.

SECTION 1: MANDATORY STANDARDS

7-2. ELECTRICAL EQUIPMENT AND WIRING. Electrical equipment shall be in safe and sound condition, and used and installed as required by labeling, listed instructions and relevant codes. Equipment and wiring shall be fastened and protected from overheating, fire, wire exposure or decay. Electrical capacity shall prevent overloading. All systems shall be free of potentially hazardous conditions due to equipment or wiring that is missing, broken, deteriorated, corroded, burnt, cracked, split, frayed or physically damaged. Equipment shall not be dirty to a degree of preventing efficient operation. Doors and panels to electrical panels, fuse boxes or other equipment shall not be missing. Electrical equipment and accessible panels not located in controlled spaces shall have tamper-resistant covers. Electrical systems shall be retrofitted with energy conservation devices that are cost-effective, such as:

- Individual or check metering;
- Power factor correction;

- o Load shedding; and
- o Other.

7-3. CONVENIENCE OUTLETS/RECEPTACLES. Convenience outlets shall be provided in dwelling units, management, and community spaces as required by code. Outlets shall be located to allow for convenient and safe use. Outlets in interior and exterior locations shall be grounded and exterior receptacles shall have ground fault protection. Outlet receptacles shall be in safe and sound condition, firmly anchored to contact devices, not subject to sparking and without evidence of scorching. Outlets shall not have exposed wires or missing cover plates.

a. Habitable Rooms. Habitable rooms in dwelling units shall have convenience outlets to allow for use of lighting, clocks and other electrical items. Outlets shall be located so that it is not necessary to use extension cords

which cross room circulation or doorways. When conditions require rewiring, grounded duplex receptacles shall be installed in all habitable rooms and hallways in accordance with relevant codes.

b. Kitchens. Kitchens shall be provided with a minimum of 2 twenty ampere grounded duplex outlets to safely and conveniently operate minor kitchen appliances. Outlets shall not be located over sinks or ovens, or require extension cords to hang freely on counters, near sinks or other areas exposed to water, moisture or heat.

c. Dwelling Unit Bathrooms. Each bathroom shall be provided with a minimum of one ground fault circuit interrupter (GFCI) outlet above or adjacent to the lavatory.

d. Reserved.

7-4. INTERIOR LIGHTING. Interior spaces requiring general illumination shall have permanent wall-switch controlled lighting fixtures. When light bulbs are provided for required illumination in public spaces, they shall have, as a minimum, translucent vandal-resistant bulb covers or globes. Naked bulbs are not permitted. Lighting fixtures shall provide light for the intended use, be supported and anchored, and be safely and soundly wired. Globes and fixtures shall not be broken and wires or internal mechanisms shall not be exposed. Controls shall be operable and protected from misuse. Lighting systems shall be retrofitted with energy conservation opportunities or devices determined cost-effective, such as:

- o Lamp wattage reduction;
- o High efficiency ballast installation;
- o Daylighting control;

- o Incandescent conversion to fluorescent;
- o High efficiency lamp installation; or
- o Other.

In dwelling rooms with a minimum of three duplex outlets where one duplex is operated by a wall switch, a permanent over-head lighting fixture is not required. Permanent light fixtures are required for bath, toilet, kitchen and laundry areas.

7-5. OUTDOOR LIGHTING. Outdoor lighting shall be provided for safe and convenient site access, circulation, and building entry.

a. Site Lighting. Site lighting shall not cast uncomfortable light directly into dwelling units. Tall trees or shrubbery that cast shadows, preventing lighting of entrance doors or other vulnerable areas, shall be trimmed. Lighting fixtures shall provide light for intended use, be supported and anchored, be vandal-resistant and be safely and soundly wired. Globes and fixtures shall not be broken and wires or internal mechanisms shall not be exposed. Controls shall be operable and protected from misuse. Outdoor lighting shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Sodium vapor conversion;
- o Photo-cell or time clock control; or
- o Other.

b. Entrance Lighting. Building, service, and exterior dwelling unit entrances shall have permanent, vandal-resistant lighting fixtures. Dwelling unit entrance lights shall be wall-switch operated from the unit interior. Public and service entrance door lights shall have tamper-resistant operations accessible only to authorized personnel.

7-6. EMERGENCY LIGHTING. Twenty-four hour emergency lighting shall be provided for all fire exits, public stairways and corridors, and elevators.

7-7. ELECTRIC UTILITIES. An underground utility system shall not be substituted for an existing overhead utility requiring replacement, except where mandated by local code.

7-8. RESERVED.

7-9. RESERVED.

SECTION 2: PROJECT SPECIFIC STANDARDS.

7-2B. ELECTRICAL EQUIPMENT AND WIRING. Electrical panels subject to continued abuse may be provided with lockable metal cases or moved to locations 7 ft. or more above the ground.

7-3B. CONVENIENCE OUTLETS/RECEPTACLES.

a. Reserved.

b. Kitchens. When electrical installations are to be upgraded, or kitchens are to be substantially rehabilitated, a minimum of one convenience duplex outlet at each counter space wider than l2 inches should be provided. Countertop spaces separated by appliances should be considered separately. Receptacles rendered inaccessible by major appliances should not be considered as required outlets.

c. Bathrooms. All 125 volt 15 and 20 ampere outlets may have ground fault circuit interrupter protection.

d. Equipment and Appliance Outlets. When newly installed, outlets for special appliances such as laundry or kitchen equipment should be placed for adequate support within 6 ft. of the intended location of the appliances. Heavy duty fixed equipment or appliances should have individual branch outlets with a minimum capacity of 20 amperes. 120/240 single phase outlets should be provided when window air-conditioners are permitted or through-the-wall sleeves for air conditioning are installed.

7-4B. INTERIOR LIGHTING.

a. When adding or replacing lighting fixtures, accessibility for relamping should be considered. Suspended lighting fixtures that will collect dust and create a cleaning or maintenance problem should not be used.

b. When replacement is required and vandalism is a problem, glass light globes should be replaced with high impact plastic or other vandal-resistant fixtures in all spaces, excluding those within dwelling units, where permanent fixtures are provided.

7-5B. OUTDOOR LIGHTING.

a. Site Lighting. In areas where lighting systems have been vandalized and abused, the following should be considered:

- Provision of high intensity lighting such as mercury vapor, metal halide and high or low pressure sodium in outdoor areas requiring high visibility;

- Use of keyed switches to prevent unauthorized manipulation; and

- o Use of building mounted outdoor lighting.

b. Entrance Lighting. Dwelling unit entrance lights may be provided to make an entrance more secure.

c. Lighting Levels. Lighting levels for areas requiring security and surveillance generally should be a maximum of 5 to lO footcandles.

7-6B. RESERVED.

7-7B. RESERVED.

7-8B. EMERGENCY CALL SYSTEMS. Where required by local code, emergency call systems may be provided in dwelling units where elderly or disabled tenants are living alone.

7-9B. TELEVISION ANTENNAS. A master-television antenna system may be provided in multi-family projects consisting of 20 dwelling units or more, or in buildings with greater than two floors that do not have cable service (CATV) and where existing television reception is unsatisfactory. The cable television system is the responsibility of the CATV company and the individual resident.

CHAPTER 8. STRUCTURAL SYSTEMS

PERFORMANCE OBJECTIVES

8-1. GENERAL. Structural systems of all buildings, accessory structures and building elements shall be consistent with the MPS and provide the following:

a. Sufficient strength, stability and rigidity to safely support all anticipated loads with code required safety factors;

b. Resistance to fire, corrosion, decay and other destructive forces through adequate protection;

c. Reasonable durability for the expected life of the rehabilitated structure; and

d. Compliance with relevant health, safety and fire codes.

SECTION 1: MANDATORY STANDARDS

8-2. STRUCTURAL MEMBERS. Structural elements shall be in sound condition and free of all deficiencies that could lead to failures, dislodging or collapse. Structural elements and spaces shall be free of the penetration of water, moisture, infestation or causes leading to decay. Walls, floors, chimneys and stairs shall not have major sag or be out of plumb. Structural elements shall not have been weakened by fire, earthquake, wind or flooding.

NOTE: Major bulging of exterior walls, doors or windows not fitting properly in their frames, or large cracks and major water staining may indicate major structural problems.

Project rehabilitation should not be undertaken prior to the correction of structural deficiencies. When extensive repair or replacement of primary structural elements is necessary to make a building safe and structurally sound, the PHA shall consider the physical and financial feasibility of rehabilitation prior to any further planning.

8-3. STRUCTURAL SPACES. The entrance or accumulation of water, moisture or heat that would be conducive to the decay, deterioration or failure of building structure shall not be permitted. Structural spaces shall be ventilated by natural or mechanical means to effectively minimize these conditions. There shall be permanent access to structural spaces, such as attics and crawl spaces, for periodic inspection and maintenance. This access is to be limited to authorized individuals.

a. Foundations, Basement and Crawl Spaces. Foundations,

basements and crawl spaces shall not permit entrance of water and excessive moisture. Exterior openings in foundations and walls at grade or below grade, including pipe, vent and conduit openings, shall be protected against the passage of rodents or infestation. For technical requirements, see

paragraph 2-5. Foundations, basements and crawl spaces shall be in sound structural condition, adequately plumb to carry anticipated loads, and free of major holes, cracks, bulging, spalling, decay or moisture penetration. All masonry walls shall be free of efflorescence.

b. Decay Protection. All habitable, mechanical and structural spaces located below grade shall be protected from the causes of decay by ventilation; waterproofing as required; and drainage of water away from the building.

SECTION 2: PROJECT SPECIFIC STANDARDS

8-2B. RESERVED.

8-3B. STRUCTURAL SPACES.

a. Reserved.

b. Reserved.

c. Security. In locations where security problems are prevalent, windows and openings on basements and crawl spaces may be protected from unauthorized entry with vandal-resistant grilles or similar systems. Security systems shall not be permanently fixed if the window or opening is a required means of emergency egress from the building. For technical requirements, see paragraph 9-7.

CHAPTER 9. BUILDING ENVELOPE

PERFORMANCE OBJECTIVES

9-1. GENERAL. The building envelope (consisting of walls, roofs, accessory construction, windows, finishes and attachments) of residential and nondwelling buildings shall be consistent with the MPS and provide for:

a. Protection of interior building components and materials from the entrance of excessive water, moisture, dust and air;

b. Health and safety for tenants;

c. Strength and stability to carry and withstand anticipated loads;

d. Fire resistance;

e. Prevention of corrosion, decay and infestation by the use of materials appropriate for local climatic conditions;

f. Anchorage to building structure as required;

g. Reasonable durability against abuse; and

f. Energy efficiency.

CHAPTER 9. BUILDING ENVELOPE

SECTION 1: MANDATORY STANDARDS

9-2. GENERAL.

a. Construction and installation of materials during rehabilitation shall be accomplished in a manner that does not promote galvanic action. Dissimilar metals shall not make contact without protection to prevent deterioration. All ferrous (iron or steel) pipes shall be protected. Architectural features, such as cornices, railings and shutters, shall be present as designed, in sound condition and anchored.

b. Wood elements used on the building exterior, including siding or trim, shall be constructed of naturally resistant species, such as redwood or cedar, or treated for weather and moisture resistance. For technical requirements, see paragraph 10-6.

c. Use of brittle or otherwise easily damaged exterior materials shall be restricted to 7 ft. or more above grade where large numbers of children are anticipated or where the probability of damage due to abuse is expected.

9-3. EXTERIOR WALLS. Exterior walls shall support imposed live and dead loads and shall be pointed as necessary, and weatherproofed to prevent the entrance of water and moisture. Openings and projections through exterior walls shall be watertight and flashed where required.

a. Vents, air conditioning sleeves and other openings shall be close fitting and properly caulked or otherwise sealed to prevent excessive air infiltration. Walls shall be free of evidence of buckling, deflection, splitting or settlement. Joint material including caulking and sealants shall function as designed, and shall not have shrunk, dried or pulled away from adjacent members. Exterior walls shall be retrofitted with energy conservation opportunities that are cost-effective, such as:

- o Wall insulation to optimal level;
- o Passive solar retrofit; or
- o Other.

b. Exterior joints between walls, foundation, roofs, around window and door frames, between wall panels, penetrations through the wall and all other such openings in the building envelope shall be caulked, gasketed, weatherstripped or otherwise sealed with non-staining materials that will remain pliable during use. Thermal conductivity (U-values) for new walls shall meet or exceed requirements of the CABO Model Energy Code, 1983 Edition as referenced in the Minimum Property Standards Section 607-1.l when cost-effective.

9-4. ROOFS.

a. Low-Sloped Roofing Systems. Low-sloped roofing systems are either built-up roofing (BUR) or non-conventional roofing (single-ply and others) and where the slope is less than 2 in l2. These systems are defined as an assembly of 4 or less interacting components designed to weatherproof and normally to insulate a building top surface. The components of a roof system consist of:

- o a structural deck;
- o a vapor retarder (where required);
- o thermal insulation (where required); and
- o a waterproof membrane.

(1) New or Replacement Low-Sloped Roofing Systems. In the selection of a new or replacement roofing system, the following shall be considered:

(a) Satisfactory record of performance in the

location of intended use, which includes durability, i.e., resistance to physical, chemical and biological factors when tested in accordance with accepted material standards.

(b) A single source warranty issued by the membrane manufacturer for the roof system performance which includes wind blow-off resistance, fire classification and durability, for a minimum of l0 years for labor and materials. The manufacturer shall be liable for the roof system performance warranty. This warranty shall include an evaluation by the manufacturer (or approved representative) of

the existing roof system for acceptability as a substrate for the new roofing system. Also, the warranty shall include all flashings, seaming (for single-ply and other non-conventional roofs), wood and metal work, sealing, access walks and other work to make a complete watertight roof membrane system. Application of the roof system shall be by contractors approved by the manufacturer. Construction shall be in accordance with the manufacturer's printed specifications, architectural detail and installation instructions.

(c) As an alternative to replacing or partially replacing a roof with a hot BUR or a single-ply membrane, one of the following cold-applied products may be used for remedial work: recoatings; cutbacks; or emulsions. Coal tar pitch and asphalt are incompatible; therefore, consult with the cold product manufacturer before using these products. There are normally no warranties associated with this remedial work.

(2) Roof Evaluation Survey. The failure to find and correct minor roof defects and deterioration in the earliest stages is probably the greatest cause of premature roof problems. This is particularly true of BURs built on low-sloped roof decks. Periodic inspection and remedial maintenance can mitigate these problems. Premature roof failure (within the first two years of roof completion) is usually due to improper application, improper storage of building products (especially felts) and improper design; and normal weathering and lack of periodic maintenance may age a roof in a time frame less than the warranted period. Roof evaluation, maintenance, application and repair should be performed by qualified personnel only. Evaluation should be

conducted by a roof consultant or a person well versed in roof failure. Manufacturers can supply this service if their product is used. (See subparagraph a(l)(b) regarding roof warranty.) There are non-destructive methods for determining the water content of a roof, i.e., Infra Red capacitance and Nuclear Meter. Minor maintenance and repair work, emergency work (required to provide immediate protection against water damage) is best performed by PHA staff, if available. Major repairs and reroofing projects should be performed by qualified roofing contractors. Where the deterioration

of the structural members is found to be extensive and beyond repair as technically determined by an architect/engineer on the PHA's staff or under contract through a roof survey, and/or where repeated and frequent membrane failures justify alternate roofing design, a comparative cost analysis shall be used to determine the best type of roof design for the structure.

(3) Performance Criteria for Low-Sloped Roof Systems.

(a) Wind. The new roof system (or re-roof system) shall withstand the wind up-lift requirements of the HUD/MPS, i.e., ANSI A-58.l 1982. Tests shall be in accordance with Factory Mutual 1-90 or 1-60 test procedures or equal.

(b) Fire. A class A fire rating (or local code requirement) shall be achieved via Underwriters Laboratories, Inc. Test procedures shall be in accordance with UL 790 or ASTM E-l08 or equal.

(c) Slope. Positive slope to drain, i.e., 1/2" in 12", shall be attained by use of tapered insulation or separation boards on top of the existing roofing structure or membrane. Resulting top surface shall be a smooth plane; ponding and other depressions shall be eliminated.

b. Steep Slope Shingle Roofing. Where slopes are greater than 2 in 12, organic or inorganic asphalt shingles shall be used. When strip self-sealing shingles are used, they shall measure approximately 12" x 36". Class "A" (fiberglass) shingles shall weigh a minimum of 240 pounds per square; Class "C" (organic) shingles shall weigh a minimum of 260 pounds per square. All shingles shall carry a 25-year materials warranty, plus a 3-year up-front warranty for labor and materials.

(1) Performance Reguirements for Steep Sloped Roofs.

(a) Fire resistance - shingles shall meet Underwriters Laboratories, Inc., test UL-790 for Class A or Class C fire ratings.

(b) Wind resistance - shingles shall meet Underwriters Laboratories, Inc., test UL-997 for wind resistance. Shingles shall resist a full gale force wind, as defined by the Asphalt Roofing Manufacturers Association (ARMA).

(c) Shingle packages shall be UL labeled and also listed by UL as meeting these requirements.

(2) Installation. Installation of shingle roofing materials and flashing shall be in accordance with the ARMA roofing manual.

(3) Reroofing. Depending on local codes, a maximum of three (original and two reroofs or original and one reroof in heavy snow load areas) roofs may be installed before tear-off is mandatory. However, the decision to reroof shall depend on the structural integrity of the supporting roof structure and the condition of the existing shingled roof. Substrate for reroofing shall be firm. If not available, ventilation shall be provided concurrently with the reroofing. Ridge and soffit ventilation is recommended.

(4) Roofing Underlayment Felts.

- Roofing underlayment felts applied to a minimum sloped roof of 4 in l2 shall be 15 pound asphalt non-perforated saturated felt (or equal).

- Low-sloped shingle roofs (2 in 12 to 4 in 12) require 2 layers of 15 pound non-perforated saturated felt.

- Some local codes may require 30 pound felt regardless of the slope.

- Wherever there is a possibility of creating an ice dam along the eaves, the underlayment shall be cemented to the substrate and to each other to a point at least 24" beyond the interior wall line of the building. Ice damming frequently occurs where the slope of the roof is between 2 in l2 and 4 in 12.

(5) Roof Ventilation. Roof and roof structures shall have natural or mechanical ventilation as required in the HUD MPS. Proper ventilation will prevent dampness and minimize

the effect of conditions conducive to decay, deterioration and excessive heat build-up. Exterior ventilation openings shall be screened to prevent unauthorized entry or the penetration of rodents or other infestation. Roof venting systems shall be in operable condition. Vents shall not be clogged or painted over or missing proper strainers.

(6) Maximum slope considered suitable for normal shingle application is 2l in 12. Applications above this slope require special nailing and cementing (i. e., Mansard roof). Use manufacturers' instructions.

c. Roof and Attic Insulation. Existing insulation and its installation shall comply with relevant fire codes and shall be anchored as required. Gaps, holes or other passages shall be effectively filled so that air will not escape from interior spaces into the attic. New or additional roof or attic insulation shall be provided if determined to be cost-effective and shall perform as follows:

- Meet applicable fire-resistance standards and comply with local fire codes;
- Not be toxic when in exposed locations;
- Settlement will not reduce insulating material to below agreed upon R value;
- Not deteriorate when wet; and
- Dry within a reasonable amount of time when exposed to moisture.

NOTE: Light fixtures or electric fans exposed on attic floors for use in spaces below shall have the insulation kept back a minimum of 3 inches.

d. Drainage from Roof. Buildings shall have a controlled method of disposal of water from roofs to prevent water penetration, property damage or public hazard. Drainage systems shall be connected to available storm sewers or provided with suitable splash blocks or empty at acceptable locations onto landscaped or paved areas. Systems shall be of size and placement to efficiently accommodate anticipated rain and snow. Drains shall be protected from the intrusion of foreign matter. Gutters and downspouts shall be securely anchored to the

building and shall be free of holes, cracks, rust or material deterioration. Gutter and leader systems, diverters, or other suitable means of systemized drainage shall be present in locations where internal systems are not provided and the following occurs:

(1) Adequately sized roof overhangs are not present to prevent drainage along exterior wall that could lead to building penetration or staining of walls, windows and doors;

(2) Ground erosion of expansion has occurred due to excessive soil saturation;

(3) Water drains on uncovered entrance platforms or steps; or

(4) Drainage patterns create hazardous areas for occupants or public.

e. Skylights. Where existing, skylights shall be weather-tight and shall be fitted to frames so as not to be a safety hazard to life or property. For technical requirements, see paragraph 9-7. In areas where unauthorized entry is a problem, skylights shall be secured with tamperproof grills, bars or other means of security. No new skylights are permitted.

9-5. CHIMNEYS. Chimneys shall be in safe and structurally sound condition. Chimneys shall be smoke-tight, capable of withstanding the action of operational temperatures and flue gases, and of sufficient height to allow proper draw for venting as required. Masonry chimneys shall not have major open mortar joints or cracks, permitting smoke or flame to be discharged into the building. Unlined masonry chimneys with deficient mortar or joints shall be either removed or made safe by the installation of a flue liner or corrosion-resistant pipe 1 inch less in diameter than the interior of the chimney.

9-6. EXTERIOR ACCESSORY STRUCTURES. Stairs, platforms and other structures accessible to tenants that extend 24 inches or more above grade shall be continuous, enclosing walls or railings at least 40 inches high. Enclosures of balconies shall be designed to prevent the passage of a spherical object measuring 5 inches in diameter or greater. Porches, balconies, canopies and roof overhangs shall be sloped for

safe drainage. For technical requirements, see paragraph 9-4. Exterior accessory structures shall be in safe and structurally sound condition, anchored and capable of supporting anticipated loads. All exposed surfaces shall be protected from decay and moisture, and shall be free of splintering, rust and material deterioration.

9-7. WINDOWS. Windows shall have required glazing that is free of holes, cracks or missing portions and shall be supported by frames that provide secure and sealed connections to the wall. Glazing, sashes and frames shall connect securely to limit the infiltration of water, moisture and air in accordance with the HUD MPS. These elements shall be free of splintering, rust or other material deterioration. Operable windows shall be easy to

open, hold open, close and lock securely. Weatherstripping shall be durable when in contact with the window sash and shall prevent excessive infiltration of water, moisture, wind, sound, light and dust. Windows shall be retrofitted with energy conservation devices that are cost-effective, such as:

- o Storm windows;
- o Thermal shutters;
- o Caulking;
- o Weathestripping;
- o Window shading;
- o Replacement windows; or
- o Other.

NOTE: Improper fit of window sashes in frames may indicate structural problems. For further information, see Chapter 8.

a. Security. All operable windows shall have keyless sash locks such as "clam shell" or equivalent interior fastener.

b. Accessory. Insect screens shall be provided for all operable windows in areas where they are needed and customarily provided. Screens shall be in safe and sound condition, and fit firmly into appropriate frames.

SECTION 2: PROJECT SPECIFIC STANDARDS

9-2B. RESERVED.

9-3B. RESERVED.

9-4B. ROOFS.

a. Surface Materials. When replacement is necessary, wood shingles and shakes should be replaced with fire-resistant materials. When repairing or replacing major portions of the roofing system, whenever possible, the color, texture and character of the new material should be compatible or matching to the existing.

b. Reserved.

c. Reserved.

d. Reserved.

e. Roof Drainage. New gutters and leaders should be consistent with successful existing systems and should be durable and resistant to deterioration by the elements. In determining which material to use, the following should be considered:

(1) Aluminum is an acceptable gutter/leader material

except in locations where aluminum-corrosive vapors (such as those present in salt air and industrial areas) are present. In these cases, plastic (vinyl) systems may be used.

(2) Exterior wood gutters and leaders should not be used because of leakage and repainting requirements. When the drainage system is an integral part of the roof, the gutter may be lined with aluminum or other durable metal.

(3) Copper gutters and leaders shall not be used except for repair work of existing systems because they are prime targets for theft.

(4) A steel boot that extends 72 inches above the ground should be provided when leaders are subject to abuse.

(5) The following should be considered when clogging has been a major problem.

(a) Increase gutter/leader diameters;
(b) Provide basket strainers at the head of the leader; or
(c) Provide screens across gutter heads.

(6) Leaders may be connected to underground storm drainage systems or dry walls (when granular soil is present) where soil erosion or flooding has been a problem. The expense of this change makes conversion a possibility only when unsatisfactory conditions are severe and where other diversion methods have proved unsuccessful. The existing storm system must also have the capacity to receive the additional load.

f. Reserved.

9-5B. RESERVED.

9-6B. RESERVED.

9-7B. WINDOWS.

a. Security. In areas where security is a problem, windows affording easy access to the premises, such as ground floor and basement windows, windows opening onto fire escapes, stairways, porches, terraces, balconies right under roofs, etc., may be provided with a better security system than keyless clam shell or equivalent sash locks. Systems may include:

(1) Security screens, grills, or window guards. Security screens and gates should be easy to open in case of

emergency or when used by the elderly or the disabled. Sliding gates which afford excellent protection and can be easily pushed aside or opened for emergency may be provided. These gates should be set in tracks on top and bottom to prevent them from being pulled or pried from the window. When wire mesh is used, the metal should be a minimum of 1/8 inches in diameter and the opening should not exceed 2 inches. The grills should be attached to the window frame with machine or round head bolts which cannot be removed from the outside. If bars are used, they should be a maximum of 5 inches apart and set at least 3 inches into the framing wall.

NOTE: Mechanisms shall comply with relevant fire codes regarding use of windows for secondary egress. Security screens shall not be permanently fixed when windows are required means of egress or interfere with the ability of residents to open or close windows for ventilation and dwelling unit comfort.

(2) Keyed window locks.

(3) Local window alarms in management, maintenance and community spaces, such as contract switch, foil strips and motion detectors, or central alarms connected to security personnel or the police. Prior to the installation of alarm systems, the following should be considered:

(a) Test of reliability of current products on the market;

(b) Commitment of security/police to respond to systems; and

(c) Problems involved with false alarms by residents.

(4) Tempered, laminated or wire glass, or other break-resistant materials on ground floor windows that are frequently vandalized.

b. Reserved.

c. Child Guards. Where required by relevant codes in multi-family projects, window guards shall be provided on exterior windows of dwelling units that are above the second floor. Installation child guards shall be in compliance with relevant fire codes.

d. Window Replacement. New windows should have the following features:

(1) Sashes and frames of the kind and quality that will withstand intense use and do not require repeated maintenance. Class A wood, vinyl clad wood, steel with baked enamel finish or A-2 aluminum may be used;

(2) Removable sashes for shop glazing when maintenance capacities exist;

(3) Insulation and with thermobreak frames if determined cost-effective;

NOTE: Windows conforming to the recommendations of AAMA 1502.6 are considered to meet this requirement. Where wood is used as the insulator, it should be treated with a water-repellant preservative;

(4) Limited infiltration into or from the building envelope, meeting MPS requirements;

(5) Maximized winter heat gain through no shading of glazed areas during the heating season. The ratio of south window to floor area should not exceed 25% without adequate interior thermal storage; and

(6) Minimized summer heat gain through such measures as horizontal overhangs for south orientations, combination horizontal and vertical overhangs for east-west orientations or tinted/reflective glass that allows pentration of winter sun.

NOTE: To take advantage of the winter heat gain, south-oriented windows should not have tinted glass or over-sized overhangs.

CHAPTER 10. PRODUCTS AND MATERIALS

PERFORMANCE OBJECTIVES

10-1. GENERAL. Construction, materials, finish and products used in project buildings and sites shall be consistent with the MPS, be appropriate for their intended use and be of the kind and quality to assure the following:

a. Rigidity, strength and stability for intended use;

b. Prevention of damage from water, moisture, decay or infestation;

c. Fire resistance and compliance with relevant fire codes;

d. Relative ease of maintenance; and

e. Resistance to abuse and misuse.

CHAPTER l0. PRODUCTS AND MATERIALS.

SECTION I: MANDATORY STANDARDS

10-2. RESERVED.

10-3. VEGETATION. Existing trees, plants and ground cover shall be healthy, stable, and provide their intended functions. Trees shall not be disruptive of building systems or designed site activities, or create hiding areas for potential vandals. Trees and shrubbery shall not obstruct views from windows to the street or building entrance areas, thus preventing surveillance for tenant safety. Planted areas that are abused by inadequately designed circulation or play areas shall be protected by railings or fencing.

a. Trees and Other Plantings. Trees, shrubbery and other plantings shall be provided to replaced dead plant materials, control erosion, mitigate summer heat and winter winds or create a more attractive environment in accordance with local standards for similar housing in the area. Vegetation can add color, texture and visual pleasure to an otherwise sparse building site.

b. Placement of Plantings. Trees and plants shall be planted no closer to the foundation of light building structures than the anticipated height of the particular plant if there are problems with shrinking/swelling of subsoils. This will minimize uneven drying of subsoil and possible displacement of structure. This concern applies to building foundations that are 8 feet or less below grade.

c. Lawns. Lawns or seeded slopes adjacent to buildings should have at least a 2 percent grade (1 percent minimum for paved surfaces). Earth banks shall have a maximum slope of 1.3 if power mowers are used.

d. Maintenance. The PHA shall provide evidence that the trees and other plantings, where provided, will be adequately maintained.

l0-4. PAVING. Paved surfaces shall be protected at the edges by curbs, gutters or other suitable means to prvent raveling and to provide for drainage and water run-off. Paved surfaces shall have surface or underground drainage systems to insure

stable soil conditions and safe use. Paved surfaces shall be free of missing portions and major cracks, holes, tripping hazards, spalling, dips or bulges. Paving shall be free of deterioration from moisture, decay or weathering.

Note: Major dips may be an indication of a problem with subsurface systems and should be investigated.

10-5. FENCING AND RAILING. Fencing and railing shall perform their intended function in an efficient manner. Fencing shall not create hiding places for potential criminals. Fencing and railings shall be stable with securely anchored members.

*10-6. FINISHES.

a. Paint. Paint to be applied on the interior and exterior of buildings shall not have a lead content greater than the amount permitted by 24 CFR Part 35. HUD regulations 24 CFR 968.9 require that all surfaces tested and found to have a lead content higher than permitted are to be treated as prescribed in the regulation to eliminate the hazards of lead-based paint poisoning. See 968.9(e) (3). Paint used on building exteriors shall be of a durable weather-resistant type to prevent excessive failure and defects. Painted surfaces shall be free of chalking, fading and/or blistering.

b. Millwork. Millwork, including windows, doors, trim, closets, etc., shall be sanded, primed and finish painted to prevent splintering or water infiltration. Millwork used on painted building exteriors shall be finished to prevent moisture penetration. Millwork shall be in safe and sound condition, stable and anchored as required. Millwork shall be free of splintering, water penetration, material deterioration, or the presence of termites.

c. Interior Areas Subject to Moisture and Water. In areas subject to water or moisture (e.g., kitchens, bathrooms

and laundries), wall, floor and ceiling finishes shall be resistant to water, moisture, and damage from grease, detergent and normal household chemicals.

d. Wall and Ceiling Finishes. Before finishing, it shall be determined that walls and ceilings are stable, anchored as required and free of moisture penetration. Walls and ceilings shall be free of holes, cracks, missing portions and material deterioration. Panels shall not sag, buckle or delaminate. All tile shall be secured and silicone caulked.

(1) Public Areas. Wall and ceiling finishes used in public and highly trafficked areas shall be of the kind and quality to provide durability and reasonable resistance to abuse and graffiti. When brittle or otherwise easily vandalized wall finishes are repeatedly abused, they shall be replaced with a vandal-resistant finish material up to 7 ft. above the floor. New or replacement finishes shall be hard-wearing, resistant to vandalism and graffiti and relatively easy to maintain. Plastic laminates, glazed tile epoxy coating or other equivalent should be considered because of their expected life, chemical resistance and easy maintenance.

(2) Bathrooms. Wall finishes at bathtubs and showers shall be water-impervious. Showers and bathtubs with showers shall have ceramic tile, porcelain steel panel or reinforced fiber glass panel finish on adjacent walls up to 6 ft. above the finished floor. Bathtubs without showers shall have a minimum of 4 rows of ceramic tile around the top of the bathtub. The finished product shall meet the standard in paragraph 5-4c. Gypsum board used as backing for wainscot in showers or tub enclosures shall be water-resistant. Insulating foil-backed wall board shall not be used.

(3) Elderly Projects. Abrasive wall products shall not be used in elderly projects.

e. Floor Finishes. Before finishing, it shall be determined that they provide safe support for all intended loads and are reasonably free of vibration or deflection. When exposed to water, all floors shall drain to maintain safe conditions at all times. Carpet shall only be provided in projects or dwelling units occupied by the elderly or the

disabled. Floors shall be in safe and sound condition, stable and anchored as required. Floors shall be free of holes, major cracks, missing portions, splintering, rust or material deterioration. Nails shall not be exposed and finishes shall be resistant to normal wear and moisture as required. Concrete floors in heavily trafficked areas shall not be painted due to the requirement for repeated painting. When not continuously maintained, the worn paint becomes unsightly.

(1) Areas Subject to Moisture and Water. In spaces subject to water and moisture (i.e., kitchens, bathrooms and laundries), floors shall be made of non-absorptive waterproof materials such as ceramic or vinyl.

(2) Habitable Rooms. Finished floors in habitable rooms shall be wood flooring, resilient tile, sheet materials or carpeting over suitable underlayment (where permitted). Carpet shall not be used in kitchens or bathrooms in any type of project. Bare concrete may only be used in regions where its use is customary, such as in hot climates.

(3) Public Stairs. Soft materials such as bluestone, slate or marble shall not be used on stair treads. The soft consistency developed hazardous cup-like wear spots with age.

l0-7. DOORS. Buildings and rooms requiring closure shall have doors that are safe to operate by children, adults, the elderly and the disabled (as required). Doors shall prevent forcible entry into buildings, public spaces and dwelling units through reinforced rigid door construction, lock block, frames and hardware that resist abuse from shock, vibration or normal use. Doors leading to the building exteriors shall prevent the entrance of the elements and shall be moisture-resistant. Doors shall be operable, in sound condition and free of holes, cracks or material deterioration. Doors shall be securely anchored to frames and free of major sagging. Operating and security hardware shall be present and operating as designed. Glazing shall

be free of cracks or holes. Exterior doors shall be retro-fitted with energy conservation devices that are cost-effective, such as:

- o Weatherstripping;
- o Caulking;
- o Storm doors;
- o Vestibules; or
- o Other.

a. Door Finishes. These shall be in sound condition, free of significant splintering, rust or chipping paint. Finishes of doors leading to laundries, kitchens, bathrooms and the exterior shall be resistant to moisture. Weatherstripping on exterior doors shall be in sound condition and air infiltration shall be minimal. Existing thresholds shall be in safe and sound condition.

b. Air Filtration. New and replacement exterior doors shall be designed to limit air leakage into or out of the building. New doors shall have air infiltration rates not to exceed 0.5 cfm per sq. ft. of door area for sliding doors or 1.25 cfm per sq. ft. of door area for swinging doors.

NOTE: Compliance with these criteria should be determined by ASTM E 283-73 Standard Method of Testing for rate of air infiltration at pressure differential equivalent to the impact of a 25 mph wind.

c. Door Frames. Door frames and their supporting walls shall be of adequate strength, stability and rigidity to hold the door securely in place. When a door is in the closed position, there shall be a maximum clearance between frame and door of 1/4 inches at top and bottom and 1/2 inch on the side. Jambs shall be of the construction quality to withstand forcible entry. When existing door frames are to be used with new doors, they shall be inspected for sufficient rigidity and strength to support heavier or operationally different doors.

d. Door Hinges. Hinges shall be resistant to abuse by dismantling, removal or spreading. All out-swinging hinges shall have non-removable pins. Doors with systems that prevent removal of a door while it is in its locked position (i.e., jimmy-proof pins) do not require non-removable pins.

e. Door Closers. All non-dwelling unit entrance doors shall be provided with a door closing device capable of closing the door regardless of the degree to which it is left open. The closing speed coupled with the door weight shall not make doors difficult to operate by children, adults, the elderly or the disabled or cause hand and finger injury by its use.

f. Glazing. Safety glazing shall be used in all sliding doors, unframed doors, glazed panels beside entrance doors, storm doors, garage doors and other glazed door panels.

g. Public Entrance and Existing Doors in Multiple

Dwelling Buildings. Public entrance doors shall have the strength and rigidity equivalent to a 1-3/4 inches solid core door. Exit doors, except for dwelling unit doors, shall swing in the direction of exit travel.

(1) Door Locks. Exterior doorways leading to garage areas, public hallways, terraces, balconies or other areas affording easy access to the premises, shall be protected by a door, which, if not a sliding door, shall be equipped with a dead lock. The lock shall use either an interlocking vertical bolt and striker or a minimum 1 inch throw dead bolt. Locks shall not require the use of a key for operation frcm the inside. For further requirements, see paragraph 4-3. For sliding glass doors, see subparagraph i(2). No new sliding glass doors may be installed, only replacement.

(2) Reserved.

h. Public Interior Doors. Public interior doors requiring locking systems shall have the strength and rigidity equivalent to a 1-3/4 inches thick solid core flush wood door. Doors not containing locks need not comply. Locking systems shall be provided according to need.

i. Dwelling Unit Entrance Doors. Dwelling unit entrance doors shall have the strength and rigidity equivalent to the following:

- o 1-3/4 inches thick solid core wood door;
- o hollow steel flush door (factory primed); or
- o solid core wood door with laminated steel sheathing on both sides (factory primed).

(1) Door locks. Exterior doors shall be equipped with a lock that is keyed from the outside and that is in good operating condition.

NOTE: Where new locks are to be provided, spring bolts shall not be used because they do not contain a deadlocking latch; slide bolts shall not be used because they normally can be activated only on the inside; and key-in-knob locks shall not be used because they can be easily vandalized.

(2) Sliding Glass Door locks. Sliding glass doors used for entry shall be locked at the top or bottom meeting rails.

j. Dwelling Unit Interior Doors.

(1) Bedrooms. In dwelling units larger than efficiency apartments, each bedroom shall be provided with a door. In multi-bedroom dwelling units, the primary bedroom shall be provided with a privacy lock that can be opened from the outside in an emergency.

(2) Bathrooms. Bathrooms shall be provided with a door with a privacy lock that can be opened from the outside in an emergency.

(3) Closets. Closets shall be provided with doors in sound condition, with all required hardware and that are convenient to operate.

(a) New and replacement doors and hardware should be durable and study. Connectors and tracks should be consistent with door weight and operation. Lightweight bi-fold doors shall not be used for replacement because of their lack of durability under intense use.

(b) Single door closets shall be hinged, 1-3/8 inches hollow core doors with heavy duty latch set and set and permanent pinned hinged hardware. New

and replacement door closets should have sliding hollow core doors no more than 80 inches high with steel floor tracks, nonremovable sliding hardware and a nylon guide on the floor.

k. Screen/Storm Doors. Exterior dwelling unit entrance doors shall be provided with screen/storm doors in climate areas where provision is customary. Screen/storm doors shall have self-closing devices. Replacement and new aluminum screen/ storm doors shall have stiles measuring a minumum of 1-1/4 inches by 3-1/2 inches.

l0-8. ELEVATORS. Elevators shall be provided in residential buildings of 5 stories or more. Elevator equipment and installation shall insure safe, dependable and easily operated vertical transportation and shall be of the kind and quality to sustain continued use. Tne entire elevator installation, including shaft, machinery and cab, shall conform to all revelant codes. To assure safe operating conditions, control panels, operation buttons and indicators shall be operable and functioning as designed. All required security measures shall be present. Elevators shall be self-leveling and shall, within its zone, be entirely automatic and independent of the operating device. Elevators shall correct for over-travel, undertravel and rope stretch. The car shall be maintained

approximately level with the landing irrespective of load. New and replacement elevators shall conform to the safety code for Elevators and Escalators, ANSI A 17.1-1981.

a. Fire Safety. Elevator shafts shall be enclosed or prctected to prevent the spread of smoke or fire. Elevators with existing fire alarm systems shall have a recall system that returns elevators to the first floor in case of fire.

b. Elevator Cabs. New and replacement elevator cabs shall be provided with the following elements:

(1) Anchored handrail on a minimum of one wall. New handrails shall be made of stainless steel and shall be mounted 32 inches above the floor. Aluminum shall not be used;

(2) Permanent and vandal-resistant lighting system. Fixtures with shatterproof plastic bulb cover or fixtures of equivalent durability shall be used as required;

(3) The minimum system of operation shall be full selective automatic operation. Each landing (except terminal landings) shall be equipped with both up and down call buttons;

(4) Mushroom-type buttons in elevator cabs and lobbies shall be used instead of flush buttons because they are more resistant to misuse;

(5) Plastic laminate doors recessed in a stainless steel framing material on both sides. Painted wood or bronze doors shall not be used;

(6) Sliding cab doors which are less subject to abuse than swing doors which jam and short circuit easily when misused; and

(7) Protection pad hooks in a minimum of one elevator per building.

c. Machinery. Motors and other machinery shall be designed and mounted so as to avoid transmitting vibration to the structure. Machinery room temperatures shall be maintained no less than 40F and more than 110F at all times, including winter and summer. Elevator shafts shall contain lighting for maintenance, inspection and cleaning. Shaft walls shall be as smooth as possible to prevent accumulation of lint and grease. Adjoining elevator pits shall be separated by chain-link fencing or other systems to prevent accidents.

SECTION 2: PROJECT SPECIFIC

10-2B. REHABILITATI0N, ALTERATION AND REPAIR. Deteriorated architectural features should be repaired rather than replaced, wherever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture and other visual qualities.

l0-3B. VEGETATI0N.

a. Replacement Plants. When replacement or new trees or plantings are provided, the following should be considered:

(1) Species that thrive in the area or have proven that they will thrive in similar climates without the need for unusual amounts of fertilizers, pesticides, water or care.

(2) Trees and shrubbery should be planted where roots will not become a hazard to plumbing lines, interfere with maintenance of gas lines or other underground utilities, and where watering will not soften soil near the building foundation. Trees should be located a minimum of 15 ft. away from any building foundaltion or l0 ft. away from walkways.

(3) Trees, shrubs, and plantings should be set back a minimum of 6 ft. from curbs where automobiles are to be parked;

(4) Mowing strips may be used against buildings, under fences, etc. to eliminate hand trimming of lawns;

(5) Metal edging or grass barriers may be used around trees to reduce damage from mowers. A minimum of l2 inches of unplanted area may be provided where hand mowers are to be used and 24 inches where rider-type mowers are to be used; and

(6) Where project streets are not city-owned, street trees may be provided to assure that sidewalks are shaded. Trees should be at least 3-1/2-4 inches caliper, if planted as indicated by the nursery furnishing the plants. Tree guards should be furnished as required.

b. Reserved.

c. Reserved.

l0-4B. RESERVED.

l0-5B. RESERVED.

l0-6B. FINISHES.

a. Paint. Repair painting should be of proper type and should match existing surfaces as closely as possible. Newly painted areas should extend to natural points such as corners, foundation walls or changes in materials so as not to create unattractive painted surfaces.

(1) When paint is used on building exteriors, the following should be considered:

(a) Local conditions such as excessively hot/dry climates or salt-air locations should influence the selection of exterior painting materials; and

(b) Paint used for exterior application should either be inherently mold-resistant or include a suitable fungicide as part of its formulation.

(2) In selecting paint for walls and ceilings, the following should be considered:

(a) Public spaces and heavily trafficked areas should be painted with water-based epoxy paint for increased durability, maintenance and greater reflectance of light;

(b) Areas exposed to moisture or water should be painted with oil-based enamel paint or equivalent. Flat paints should not be used; and

(c) In non-mechanical or custodial areas where concrete block is used, surfaces may be painted with epoxy resin, latex based or high gloss finish. These paints provide a more attractive, sanitary and more easily maintained wall surface.

b. Reserved.

c. Reserved.

d. Reserved.

e. Floor Finishes.

(1) Where carpeting is provided in elderly projects, management offices or community spaces, the following should be considered when replacement becomes necessary:

(a) Where wheelchairs or cart traffic (delivery and maintenance) are anticipated, carpeting with a dense, low-pile structure should be used;

(b) When using carpeting in public areas, cut pile over 3/8 inches shall not be used;

(c) Carpets should have maximum static resistance and shall comply with relevant fire codes;

(d) Carpets with mixed colors (especially four-color tweeds) provide for greater ease of maintenance. Light and dark colors show dirt more readily; and

(e) If carpet is used in management offices or community spaces, large ball casters should be used for movable chairs, furniture and equipment.

(2) When maintenance of public entrances and hallways is difficult due to excessive amounts of dirt infiltration, the following may be considered:

(a) Provide a permanent, vandal-resistant entrance mat at building entrances. Mat depth should be a minimum of 3 ft., preferably 4 ft. in width. Aluminum or stainless steel grates are preferable.

(b) Provide a catch pan with grate immediately in front of the entrance door to reduce intake of dirt; or

c) Provide a highly textured surface, such as rough granite or concrete in vestibule or lobby entrances, to catch dirt from shoes before entering buildings.

(3) When sealants are required, the following should be considered:

(a) In bathrooms, exterior edge of sub-flooring and finishes floor (where floor abuts vertical surfaces) may be sealed against water penetration;

(b) Sealer may be applied to more absorbent grout to prevent moisture and soil penetration;

(c) Mastic may be used for water resistance;

(d) Synthetic plastics or sealed Portland cement grout may be used as recommended for moisture-impervious floor surfaces; or

(e) Tan or gray grout may be used in lieu of white on tile floors to minimize appearance of dirt.

(4) When leakage and overflow have been major problems leading to penetration of flooring subsystems, floor material should be replaced with waterproof materials and subsystems.

10-7B. DOORS.

a. Reserved.

b. Reserved.

c. Door Frames.

(1) Door frames used in areas subject to abuse should be as follows:

(a) Solid wood frame with a minimum thickness of 2 inches;

(b) Solid wood frame with an l8-guage steel sheet covering; or

(c) l6-guage hollow steel frame reinforced at the hinges and filled with a crush-resistant material filling the frame.

(2) In locations where security is a problem, the following may be considered:

(a) Provide a metal angle along the opening between the closed door and frame at the location of the locking system to prevent insertion of tools. The angle iron should be a minimum of 24 inches long, mounted at the strike;

(b) Provide in-swinging doors with rabbetted jambs where the door stop is an integral part of the jamb or is securely set into a deep groove. Stops should not be surface-

attached to the jamb;

(c) Use tamper-resistant connectors;

(d) For metal frames installed in masonry walls, fill space between the jamb and the wall with masonry; and

(e) Provide wood spacers in the space between a wood frame and the stud where hingers are attached to prevent spreading of the frame to prevent break-ins.

d. Door Hinges.

(1) Removable hinge pins may be converted into nonremovable hinges by the insertion of machine screws (non-removable) into each pin center. An alternate method is to hammer both ends of the hinge so that the metal of both operable pieces are forced together, preventing easy removal.

(2) Commercial or heavy-duty hinges should be used in lieu of residential hinges in public and dwelling unit locations where there is intense or abusive use.

e. Reserved.

f. Glazing. Polycarbonate, acrylic, plastic, laminated glass or tempered glass may be used in locations requiring increased resistance to abuse. Provision of these materials shall be in compliance with all relevant codes.

g. Public Entrance and Exit Doors in Multiple Dwelling Buildings.

(1) Door Locks. If additional security is required, intercom systems may be considered. Additionally, new key systems should be analyzed prior to installation. Registered key systems, though generally more secure, are costly and difficult to reproduce. Master key systems are subject to potential misuse, which may outweigh the benefit of ease of maintenance.

(2) Fire Exits. In locations where vandalism and un1awful entry have been a problem, fire exit and fire stair doors may have interior panic hardware with no exterior hardware. Panic hardware shall consist of a vertical bolt and a crash bar with automatic closing, and where required, a alarm.

NOTE: This system will only be successful with full tenant cooperation (tenants tend to leave these doors unlocked when the secondary entrance is more convenient than entry through the main building entry). When a secondary door is the only direct access from a parking lot or heavily trafficked path, consider the installation of a similar security system employed at the main entrance. This alternative may provide greater security than limited tenant entrance altogether.

(a) Panic Hardware. When adding panic hardware to secondary exit doors, vertical-bolt latches should be at the top and bottom of the door for increased security.

(b) Vandalism. In multi-family projects where vandalism is a problem, exit doors leading to fire stairwells on each landing may be provided with a self-locking dead-latch to allow free egress while prohibiting entry.

The stair-side surface of the door should be free of hardware to prevent access to one floor from another via the stairwell. Hardware should limit access to the roof or ground floor exits via the stairwell provided relevant code requirements are not violated.

(3) Garage Doors. In areas where vandalism is a problem, doors leading into buildings from garages may have self-locking deadlatches that permit free egress but require a key for entry into the building.

h. Reserved.

i. Dwelling Unit Entrance Doors.

(1) Door Locks. Where security is a problem, key-in-knob and spring bolts may be replaced with a mortise lock with deadbolt having a minimum 1 inch throw or a combination of a heavy duty latch set and rim lock with interlocking vertical bolt and striker. These locks shall be constructed of case-hardened steel, brass, zinc alloy or bronze. The deadbolt shall be operated from the inside by a device no requiring a key. Lock cylinders shall be flush to the door and pick-resistant. If the cylinder protrudes from the door, a bevelled ring cylinder guard or a spinner ring shall be provided, as required. New dwelling unit doors may have mortise locks with 1 inch throw as provided for security. Additionally, the following may be considered.

(a) In locations where lock-tampering has been a problem, a flat metal escutcheon plate may be mounted to the face of a outswinging door.

NOTE: This plate extends beyond the door edge and fits flush with the jamb of the closed door, protecting the lock from abuse. Plates located on the outside of the door should be attached with tamper-resistant connectors such as round-headed carriage bolts or one-way screws.

(b) Door strikes may be secured with longer than normal screws which make breaking the strike out of the frame more difficult.

(2) Peepholes. Where required as part of a security program or mandated by relevant codes, dwelling unit entrance doors may have a peephole that shall be 1/4 inches in diameter (preventing insertion of a criminal tool), double glazing for safety, and a wider-angle lense for maximum visibility. Peepholes shall be located approximately 57 inches above the floor.

j. Reserved.

k. Screen/Storm Doors. When screen or glazed panels are continually abused, units with a guard that prevents a panel from being pushed in should be considered.

l. Kickplates. In locations where door bases are continually abused, kickplates that are the width of the door and a minimum of 18 inches high may be provided.

m. Vision Panels. In areas where visibility into spaces is needed for increased security, public doors may have vision panels made of a vandal-resistant transparent material. Vision panels shall be of a size and location on the door to allow full visibility beyond the door for security. Public entrance, laundry, community room, stair doors and other doors routinely used by tenant, may have vision panels as needed.

10-8B. ELEVATORS

a. Fire Safety. Service openings in elevators may be provided with closing devices which will close all service doors upon activation of smoke detectors. These openings should be located inside and outside the shaft enclosure if acceptable to the unit of government having jurisdiction.

b. Elevator Cabs. If crime or abuse is problem, the following may be considered:

(1) In existing cabs:

(a) The elevator control system may be altered to an "updischarge, down-collect" system in which the elevator will only stop at the floor indicated by the passenger at the ground floor.

Passengers on upper floors may enter the cab only on the down (collect) trip.

NOTE: Although this system creates a longer waiting time, it does assure riders that they will reach their destination without someone else getting on at an intermediate floor. This method is not fool-proof, yet it is an inexpensive measure for an increased means of security.

(b) Wide-angle vandal-resistant surveillance mirror may be mounted at an upper back corner of the cab to allow total visibility into cab; and

(c) Television or auditory monitoring systems may be provided in elevators where other security techniques have been unsuccessful. The system and its components shall be protected against abuse.

(2) In new elevator cabs:

(a) Television or auditory monitoring systems in situations where other security techniques have not been successful. The system and its components should be protected against abuse;

(b) The escape hatch in the ceiling of the elevator cab may be secured from the outside, to be opened only by trained personnel when evacuation is necessary;

(c) A position indicator may be provided in the car of tenant elevators serving 3 or more floors which will indicate by audible and visible signals the floor at which the car is stopped or is passing. Frequently abused indicator lights may be protected by a heavy-duty plastic shield or other

equivalent system. Indicator lights tend to reduce user impatience which may result in less wear and tear on the buttons. However, in some cases where the indicator lights are repeatedly abused, it may be necessary to totally eliminate them;

(d) Correction buttons to "erase" floors which were selected by mistake or abuse may be provided. Under these conditions, the use of correction buttons will eliminate large amount of stops and starts that affect maintenance and operating costs; and

(e) Handrails, wall panels, doors and their frames, control panels and floors should be stainless steel. In locations where abuse is not a serious problem, plastic laminate or materials with similar mantenance characteristics may be used on cab walls.

c. Reserved.

d. Other Vandal Resistant Materials

(1) Metal floor indicator and call buttons.

(2) Painted wood or bronze elevator doors may be provided with stainless steel or plastic laminate kick-plates on both sides as required.

(3) Transparent vision panels or hatch doors that are continually vandalized may be replaced with a vandal-resistant material.

APPENDIX 1: PROHIBITED WORK ITEMS

Regional and Field Offices shall carefully review proposed work items and reject those which are clearly ineligible. The following are examples of work items that are expressly prohibited and shall not be approved under any circumstances.

1. Swimming pools.

2. Saunas.

3. Whirlpool baths, hot tubs.

4. Barbecue pits.

5. New balconies.

6. New skylights.

7. Ramadas.

8. Atriums.

9. Dishwashers.

10. Garbage disposals, unless required by local code for existing units.

11. Carpeting in family units.

12. Individual apartment/dwelling unit trash compactors.

13. Wallpaper in either public areas or in residential units.

14. Conversion of retail electric, gas or water utility services to master meter systems.

APPENDIX 2

INDEX

INDEX

APPENDIX 2

INDEX

APPENDIX 2

INDEX

Item Page

APPENDIX 2

INDEX

Item Page

APPENDIX 2

INDEX

Item Page

APPENDIX 2

INDEX

Items Page

APPENDIX 2

INDEX

Items Page

APPENDIX 2

INDEX

Items Page

APPENDIX 2

INDEX

Items Page

APPENDIX 3. PHYSICAL NEEDS ASSESSMENT - COMPREHENSIVE IMPROVEMENT ASSISTANCE PROGRAM

SECTION 1. INTRODUCTION

1. OBJECTIVES. This Appendix contains instructions for use of the Survey Instrument in conducting the required physical needs assessment under the Comprehensive Improvement Assistance Program (CIAP). Data derived from this assessment will permit completion of the Form HUD-52825, Comprehensive Assessment/Program Budget (See Appendix 10, CIAP Handbook 7485.1 REV-2), and will serve as a verification of the project's needs during the Joint Review. This Survey Instrument is completed by the PHA before the Joint Review.

SECTION 2. INSTRUCTIONS

2. ORGANIZING FOR THE SURVEY. The physical needs assessment shall be undertaken in preparation for the Joint Review. Performance of the assessment, especially in large PHAs with sufficient staff, may be accomplished via a team approach or separate teams doing the assessment and the energy audit. The PHA should organize the assessment by:

a. Reviewing the Survey Instrument to become familiar with the types of information requested. Disregard items which do not apply to the particular project's physical characteristics.

b. Identifying personnel responsible for conducting the assessment.

c. Obtaining information from prior surveys that might have some of the data required for the physical needs assessment.

d. Recording information from project architectural and mechanical drawings and prior relevant surveys onto the Survey Instrument.

3. SCOPE OF SURVEY. Judgment must be used in determining the extent of the survey. For example, when conditions are known to be similar in all units, a sampling of dwelling units may be surveyed. When variations are substantial, a 100% survey shall be conducted. In determining the extent of the survey, the following precepts shall apply:

a. Nondwelling Spaces.

(1) If possible, survey all nondwelling spaces, but at least 50% if conditions are known to vary; or

(2) If all such spaces are known to be in the same condition, survey at least 20% of the total.

b. Dwelling Units.

(1) Of all units are in similar condition, survey 10% or a statistically valid sampling of the dwelling units. Include in the sampling each type of unit size, e.g., one-, two-, and three-bedroom, and survey typical unit types in typical buildings.

(2) Survey those units which are more subject to architectural stress, such as:

(a) ground floor units;

(b) units underneath the roof;

(c) units adjacent to elevator cores; and

(d) units on the sides of the building which receive the most weathering.

4. SURVEY INSTRUMENT. The Survey Instrument is divided into sixteen components which simulate the way in which an inspector would "walk though" a public housing project. These components are listed at the beginning of the Survey Instrument.

a. Abbreviations and Symbols. The Page content for nondwelling spaces is similar for the first fourteen components of the survey. A sample page (Figure 1) is provided with both abbreviations and symbols noted. These are explained as follows:

(1) The four categories of need are noted by the following symbols:

- E, Emergency - health and safety items requiring immediate correction.
- En, Energy items which are energy related and may be a part of a cost-effective energy conservative opportunity (ECO) selected from HUD publication, Energy Conservation for Housing: A Workbook (HUD-PD-700(3) or other HUD-approved energy audits. In such cases, Handbook 7485.2 REV-2 should be referenced as well as the completed energy audit to determine the extent to which an actual ECO is involved.
- S, Security - project specific items which are

related to tenant and project security.

- o Ps, Project Specific - other project specific items which are necessary for long-term viability.

(2) Each condition is keyed by the surveyor to the applicable four categories of need.

(3) The Survey Instrument is keyed to the applicable section of this Handbook, e.g., in Figure 1, ROADs, GENERAL 3-2 references Paragraph 3-2 of the Handbook.

(4) The box S, Satisfactory, is to be checked by the surveyor if the condition of the survey item is satisfactory, requiring no remedial action.

b. Page Structure Dwelling Unit Inventory. The dwelling unit survey consists of two parts: the Project-Wide Dwelling Unit Inventory; and the Dwelling Unit Survey.

(1) Project-Wide Dwelling Unit Inventory provides for the collection of information about the generally prevalent characteristics and conditions of all the dwelling units and serves as a one-time general evaluation about such features. The profile is completed one time for each bedroom size and different configuration. Conditions surveyed are of the type that apply to all dwelling units of the given size and type. Hence, there is no need to survey all dwelling units to ascertain the presence of items. For example, if closets or kitchen

storage facilities are not equipped with doors, there is no need to complete this question for all dwelling units. The findings of this survey must be expanded, however, to cover all of the bedroom unit types surveyed.

(2) Dwelling Unit Survey covers any problem items specific to the condition of the individual dwelling unit being surveyed which is not generic to the class of dwelling units. In the example above, one would be concerned with the condition of closets and of kitchen storage facilities, but not the absence of doors.

6. PHYSICAL NEEDS ASSESSMENT ANALYSIS. The following steps must be taken after the physical needs assessment, including the energy audit, is completed.

a. Quantify and Expand. The analysis of the assessment and energy audit should be done jointly after quantities of work items have been summarized on each individual survey summary sheet (Figure 2). This is so that a joint agenda

may be prepared for subsequent costing and so that related work items may be combined into single tasks.

(1) If less than 100% of the project was Surveyed for certain work items, the quantity required for remedial action should be expanded to cover the entire project. For example, in a 50% survey of 100 units:

Remedial Action	Survey Coverage	Quantity Observed
Patch and Plaster 25 sq. ft. of bathroom walls	50%	50 bathrooms x 25 sq. ft. or 1250 sq. ft.

If all bathrooms are likely to require the above remedial action, the expansion to 100 units is calculated dividing the quantity observed (1250 sq. ft.) by the percentage of survey coverage (.50). The quantity eyed is 2500 sq. ft. The expansion should be written on the survey. Figure 2 shows addition samples.

FIGURE 2, APPENDIX 3

SAMPLES OF EXPANDED SURVEY ITEMS

250 Unit Project in 5 Buildings

Remedial Action	Survey Coverage	Quantity Observed	Quantity Required	Quantity Expanded
Install parking lot wheelstops	50%	20LF	20/.50	40LF
Install closet doors in dwelling units-all	30%	75	250 or 75/.30	250
Install closet doors in units - building 1 only	100%	50	50	50
Recaulk around bathtubs	30%	9 LF	9x75/.30 or 9x250	2250LF
Replace screen windows	30%	40	40/.30	133

APPENDIX 3

b. Organize. The organization of the quantified results should follow the 16 general areas of the Survey Instrument. PHAs

will be able to identify comprehensive systems of improvements, which include the results of the energy audit, in the following fashion on the suggested Project Cost Estimate Worksheet, Figure 3:

(1) Identify project building component, i.e., site, building envelope, etc.

(2) Identify itemized remedial action, i.e., install, repair, or replace.

(3) Transfer units and quantities onto the Project Cost Estimate Worksheet, i.e., linear feet, square feet, each, etc.

(4) Check from survey(s) if the remedial action is an emergency, energy, security or project specific item. If it is an energy item, record the cost of installation in the cost column and check the column marked EN, as well as the other columns for which the item is appropriate. Note that the cost of an energy item will come from the energy audit.

c. Estimate Costs. With the above steps completed, projects should have a composite listing of remedial actions and quantities needed to bring the project up to the mandatory standards. This listing from the Project Cost Estimate Work-sheets must be cost estimated, using the category of improvements for which funds are to be requested on Form HUD-52825. The following steps are suggested to obtain total costs:

(1) Ascertain PHA in-house capability.

(2) If there are no in-house cost estimation procedures, obtain estimates from locally recognized cost indices, local cost estimators or from any source commonly used and approved by the PHA.

(3) When a source has been identified, note that the estimate must include the total or unit cost of an item installed. Note where force account labor is used, materials, labor, supervision and job-related costs shall apply.

(4) Since all cost estimates must specify materials, in the event that material specifications exceed the mandatory standards, due to current materials, security or individual project requirements, provide a justification with the Final Application.

(5) Record the unit cost and total cost in the appropriate

columns, making sure that appropriate category columns are checked, i.e., E(emergency), En(energy), S(security), Ps(project specific). Some items may be appropriate for more than one category column.

(6) Cost estimates are to include all needss for which funds are required. This includes demolition, construction, finishing, and related repairs thereto as well as installation, materials, labor and supervision. The Project Cost Estimate Worksheet and supporting documentation shall be presented at the Joint Review. The PHA shall indicate when labor costs are based on force account.

(7) Whenever possible, obtain costs for systems of improvements which may allow quantity cost savings on packages which will remedy several problems with a single cost and material.

(8) Total all costs with a check in the E(emergency) column. To prevent double counting, note whenever the item is also an ECO. This may be noted as a subtotal, i.e., Emergency - Energy.

(9) Total all costs with a check in the PS(project specific) column. Avoid double counting for ECOs; utilize sub-totals, i.e., Project Specific - Energy.

(10) Total all remaining costs which have no check in the PS or E columns, again insuring against double counts by noting subtotals.

(11) Record any remaining ECO costs deemed cost-effective from the energy audit and not recorded in any of the above totals.

(12) Add all of the above to obtain the grand total cost estimate for the project. Figure 4 demonstrates this costing procedure.