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Shaker Heights has a distinctive physical character that is both locally and nationally significant. High-quality housing stock contributes to the character of the city. However, much of the city's housing stock is older and requires regular inspection and maintenance.

The Building Code for the City of Shaker Heights requires that you maintain your home to specific standards. These standards ensure that your home is safe, structurally sound, and in good repair. This guide is designed to acquaint you with Building Code standards and encourage you not only to maintain your home to these standards, but also to preserve and enhance its architectural character.

The *Homeowners' Guide to Preservation and Maintenance* has two purposes:

The first purpose is to inform residents about the history and architectural heritage of Shaker Heights and to describe the predominant architectural styles in the city. The text also explains which city departments, boards, and commissions will play a role in the maintenance and repair of your home. Included is a glossary to familiarize you with architectural and construction terms and an extensive resource listing to help you locate books, articles, videotapes, and other sources dealing with home maintenance, repair, and improvement.

The second purpose of this guide is to help you make repairs and improvements to your home and/or to assist you in choosing professionals to make them. The guide includes a home inspection checklist of common home maintenance problems. Ideally, you should use the checklist to inspect your home twice a year—in the spring and fall. Also included are repair sheets which explain how you can make various repairs to your home and how contractors and tradespeople will handle certain projects. Each sheet covers problem assessment, repair procedures, design considerations, and other pertinent issues for specific repairs. Each sheet also lists additional sources to consult when making a repair.

The City of Shaker Heights was planned, designed, and largely constructed as an ideal “Garden City,” a residential community in a natural, park-like setting. The section on the history of Shaker Heights establishes the context for the *Homeowners’ Guide to Preservation and Maintenance* by explaining why Shaker Heights is significant in terms of planning and architecture. It introduces the people and ideas that influenced the physical development of the City.

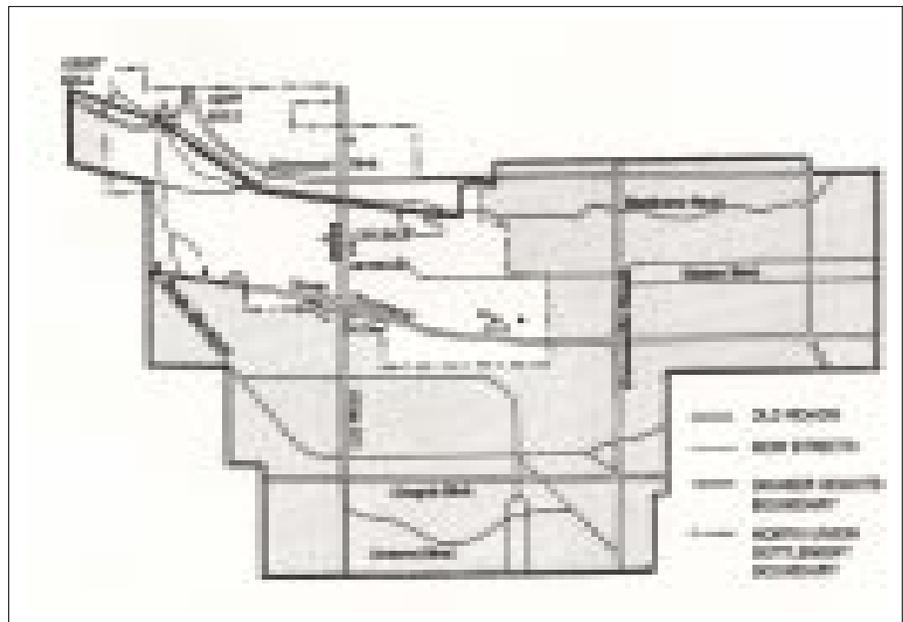
The North Union Shaker Community

Part of Shaker Heights was originally settled by the North Union Shakers in 1822. The settlement encompassed 1,366 acres in “The Valley of God’s Pleasure” adjacent to Doan Brook.

The Shakers were primarily farmers, although millers and artisans also played important roles in their community. The Shakers built a gristmill and a woolen mill, as well as the dams that formed or enhanced the lakes and ponds which remain today as Shaker Lakes.

The utopian dreams of the North Union Shakers faded with Cleveland’s emergence as an industrial metropolis in the late nineteenth century.

Increases in the area’s population and traffic degraded the Shakers’ pastoral



Location of the North Union Settlement

setting, while their own population had diminished due to their vows of celibacy. By 1889, the twenty-seven remaining members of the North Union settlement relocated to other communities. Their local holdings, which included land, buildings, and personal property, were sold. The only remaining physical evidence of the north union community are Horseshoe and Lower Lakes, the Lily Pond, and major streets such as Lee and South Woodland Roads. Stone fence posts and millstones scattered throughout the western half of the City are also remnants of the Shaker settlement.

The Van Sweringens

By 1905, the land previously occupied by the North Union Shakers had deteriorated. Area landowners had been unsuccessful in marketing this land until brothers Oris Paxton and Mantis James Van Sweringen took an option on a small por-

tion of it. The Van Sweringen brothers previously had been involved in real estate development. One of their earlier projects was a luxury residential development in the City of Clifton Heights (now Lakewood). This endeavor failed, but a subsequent development in Cleveland Heights met with moderate success.

The Shaker lands which the Van Sweringens purchased had an excellent vista, clean air, and a mild environment. The brothers planned to develop the site as a residential suburb. Their marketing scheme to attract residents to the community capitalized on the beauty of the site and its earlier association with the Shakers.

The Planned Community

In laying out Shaker Village, the Van Sweringens and their land planners, the F.A. Pease Engineering Company, implemented the ideas of the Garden City Movement which was popular in England in the 1890's. Garden City characteristics which appeared in Shaker Village included small residential tracts, curvilinear, tree-lined streets and boulevards, and wooded buffer zones. The layout of the residential districts was meant to accommodate subsequent similar districts. Development was controlled in order to maintain a desirable level of density.

An elementary school was located at the center of each residential district in Shaker Village. This practice allowed elementary school students to live within easy walking distance of their schools. School names still identify neighborhoods in Shaker Heights, such as Boulevard, Mercer, and Fernway.

The early development of Shaker Village coincided with the migration of wealthy families away from Cleveland. Later, the Van Sweringens persuaded the private schools located in the University Circle area and the Bratenahl Country Club to relocate to Shaker Village. These prestigious institutions attracted more families to Shaker Village. The most important element in the growth of the area, however, was the development of an independent, high-speed transit system linking Shaker Village to downtown Cleveland.

Until 1915, the sale of lots in Shaker Village lagged because of poor access to downtown Cleveland. The Van Sweringens planned to connect Shaker Village to downtown Cleveland using existing streetcar lines. The plan met with resistance from streetcar firms. Even if the streetcar firms had cooperated, the plan would have been impractical because the commute by streetcar would have been too long and slow.

Instead, the Van Sweringens acquired right-of-ways to the Nickel Plate Railroad in order to develop high-speed transit trains. They eventually bought the entire railroad. High-speed transit allowed easy access to downtown Cleveland and permitted a large number of middle and upper middle class families to move to the suburbs.

Shaker Village Standards

Another key to the success of the Van Sweringens in Shaker Village were the strict guidelines they imposed on development. The Van Sweringens published *Shaker Village Standards*, which outlined design guidelines and restrictions for

residential construction. The *Standards* determined building setbacks, garage locations, grading, and exterior treatments. The *Standards* also described suitable architectural styles and appropriate materials, exterior colors, and details. In addition, the *Standards* encouraged property owners to hire an architect to design their homes.

As a supplement to the *Standards*, the Van Sweringens developed several demonstration homes on Scottsdale and Van Aken Boulevards. These homes were designed to entice potential homeowners to Shaker Village and to display the expected quality of home design and construction.



The Masthead from Shaker Village Standards

Many homes in Shaker Heights reflect the ideals of the eclectic movement in architecture which began in this country in the late nineteenth century. The movement also is referred to as “Historic Revival” because eclectic architects were influenced by traditional European and Early American architectural styles. The English Tudor, Colonial Revival, and French styles are most commonly associated with Shaker Heights. Noteworthy eclectic architects who practiced in Shaker Heights include Charles Schneider, Philip Small, Frank Meade, James Hamilton, John Sherwood Kelly, Bloodgood Tuttle, and many others.

The City also has homes in more recent styles including the Prairie and Split-Level styles. In addition, there are many examples of the Vernacular Double style which has features that are unique to the Cleveland area. Many homes do not express an architectural style in its pure form, but combine styles or express modern interpretations of historical styles. The following is an analysis of the most prominent architectural styles found in Shaker Heights.

English Tudor designs are loosely based on the architecture of Elizabethan England. Typical features of the style include steeply-pitched, front-facing gables and ornamental half-timbering. Tudor homes are often of masonry construction, although smaller Tudor homes are sometimes wood framed buildings clad less expensively in weatherboard, shingles or stucco. The development of masonry veneers in the 1920s and 1930s allowed many later Tudor homes of wood frame construction to replicate the brick and stone exteriors of English precedents without the expense of solid masonry construction.



English Tudor



The term “Colonial Revival” refers to a rebirth of interest in Early American architectural styles. Georgian and Federal are the most prominent revival styles in Shaker Heights. Colonial Revival houses tend to have symmetrical facades, shallow roofs, and classical details. Windows are usually double-hung, occurring in pairs on a façade. Each window is likely to have many small panes of glass, arranged in a grid pattern. Front doors are usually quite prominent, accentuated with pediments, fanlights, and other decorative features.

Colonial Revival



The Dutch Colonial style is a variant of the Colonial Revival style. Dutch Colonial homes are characterized by their side-gabled gambrel roofs. The steeply-pitched gambrel common to this style often contains a nearly full second story. Large roof dormers, wood clapboard siding, and classical detailing are common elements of this style.

Dutch Colonial

A French Eclectic house may have the massive, heavy look of a French Provincial farmhouse or the more refined appearance of a French chateau. In either case, there is strong emphasis on earth tones and natural building materials. Essential elements of a French Eclectic house include steeply pitched hipped or mansard roofs; roof dormers as a dominant feature; lofty chimneys; brick, stone, or stucco facades; a slate or wood shingled roof; and tall, double-hung windows with planter boxes or extended window sills.



French Eclectic

The Prairie style was developed by Frank Lloyd Wright in the first few decades of this century. Some homes in Shaker Heights reflect the influence of this style, although no pure Prairie style homes can be found in the City. In Shaker Heights, the style was often used to embellish Colonial homes. The prairie style is characterized by horizontal lines, earth tones, and simple contours. The main features of the style are low, hipped roofs with broad eaves; horizontal bands of windows accentuated with courses of brick or stone below; brick, stucco or wood shingled exterior walls, left in their natural colors; and tile, slate or wood shingled roofs.



Prairie



Vernacular Double

The Vernacular Double style was developed locally in the first quarter of the twentieth century. Vernacular Double homes were almost always designed to accommodate two families. Homes in this style are typically two- and one-half stories with simple gables and a rectangular body shape. Typical features include a prominent, two-story porch, massive columns, wide, overhanging eaves, and the use of wood shingles on some wall surfaces.



Split-Level

The practice of designing houses based on historical precedent was largely abandoned following World War II. At this time, new homes were often variations of the modern styles which had been developed prior to the War. The Split-Level style first appeared in the late 1930s, but it wasn't until the 1940s through the 1960s that the style was widely implemented in this country. Split-Level houses are typically one-to two-stories with half-story wings and sunken garages. Some houses in this style lack decorative detailing, but most have decorative shutters, porch roof supports, or other traditional details.

Preservation and maintenance are of vital importance to your home. Preserving your home's architectural details and character will enhance the appearance of your home and improve its resale value. Maintaining your home and performing repairs as needed will help prevent larger repair problems from developing and will also contribute to your home's value. This section explains some of the economic and aesthetic considerations involved in any home maintenance, repair or improvement project. It also provides guidelines for setting up an inspection and repair program for your home.

The Economics of Preservation and Maintenance

The care, maintenance, and improvement of your home have a direct impact on its value and on the quality of your neighborhood in general. Your home's architectural design also affects its value. A well designed home gives pleasure to its occupants and often has a high resale value. While the principal design decisions for your home were made at the time of its construction, any subsequent repairs or renovations should preserve and enhance the original design. As a homeowner, you have an obligation to maintain your home so that you and the other residents of your neighborhood can enjoy the greatest amount of personal satisfaction and economic benefit.

Preventive maintenance, the habitual attention to the physical condition of your home, is also an economic issue. Preventive maintenance corrects a minor problem before it becomes a major problem with a higher repair cost. For example, it is better to repair a small hole in a roof when it first appears than to wait until the leak becomes larger and the damage more extensive. It is even more important to discover the cause of the leak, in order to prevent the problem from recurring. Periodic home inspections and prompt attention to even small repair problems are the key components of preventive maintenance and help keep repair costs down.

Aesthetic Considerations and the Building Code

If you are planning a repair, maintenance or improvement project, you need to be aware of the City's Building Code standards. Any work you do must conform to the Building Code. When making repairs and improvements, however, you should go beyond what merely meets code requirements and do what is architecturally and aesthetically best for your home. For example, the Building Code allows aluminum gutters and downspouts. If your home has copper or wooden gutters, aluminum gutters would be architecturally inappropriate replacements, even though they are allowed by the Code and are acceptable for some houses. The same is true for replacing wood or stone steps with concrete steps and replacing wood siding with aluminum or vinyl. While these changes are allowed by the Building Code, they may not be the best choices for your home.

One of the functions of the City's Architectural Board of Review (ABR) is to help you make the best choices for your home from an architectural and aesthetic standpoint within the constraints of the Building Code. The City's Building Department will issue a permit only if the proposed exterior work has been approved by the ABR and meets the requirements of the Building Code. Interior work does not require ABR approval, but must conform to the Building Code.

Home Repair and Improvement Plan

Before making any repairs or improvements, you should inspect the current condition of your home. In the center of this guide (pages 29-30) you will find a Home Inspection Checklist. Use it to inspect your home and evaluate its condition. Inspect your home every spring and fall so that you can find and correct small problems before they become large problems. For each area addressed on the Checklist, there are Repair Sheets at the end of this book to assist you in making the repairs.

Once you have assessed the current condition of your home, you should prioritize potential repairs and improvement projects. First, you should address serious problems, those which affect the safety and structural soundness of your home. Next, you should undertake repair and maintenance projects to bring your home into compliance with the City's Housing Maintenance Code. Finally, you should address minor problems before they become major problems. This also is the time to consider making any desired improvements to your home.

Having determined and prioritized the types of repair, maintenance, and/or improvement projects which are appropriate for your home, you should establish some long-range goals and objectives, including a schedule of when proposed projects will occur. Any repair, maintenance, or improvement project must take into account your budget and lifestyle. While very serious problems require immediate attention regardless of the cost, many projects can be completed in phases. When you complete a project in phases, it is easier to budget for the necessary expenditures. However, in order to do this, you must be willing to make adjustments to your lifestyle to accommodate a long-term construction project.

Consider how much of a given project you intend to complete yourself. Do-it-yourself projects often offer a cost-saving alternative to hiring professionals, provided that you have the necessary time and skills to complete the projects you begin. The Repair Sheets, mentioned above, include guidelines to help you determine whether to complete a repair or improvement project yourself or hire a professional.

The City plays a role in many home repair and improvement projects. It is up to you (or your contractor) to obtain any necessary permits or approvals prior to beginning work. This section describes the types of projects regulated by the City's various departments.

Planning and Development Department

The Shaker Heights Planning and Development Department plays a key role in the review of maintenance and improvement projects through the administration of the Architectural Board of Review, the Board of Zoning Appeals, the City Planning Commission, and the Landmark Commission. New buildings, additions, exterior alterations, increases in paved area, and some fences require review by one or more division of the Planning and Development Department.

The Architectural Board of Review (ABR) reviews plans for new buildings and for all exterior changes to existing buildings, including additions, window and door changes, auxiliary structures, decks, re-siding, and re-roofing. For plans to be approved by the ABR, design solutions for new buildings must be compatible with the existing built environment. Additions and alterations must complement a home's architectural style.

The Board of Zoning Appeals (BZA) and the City planning Commission (CPC) help maintain the character and density of neighborhoods through the administration of the Zoning Code. The Zoning Code regulates the type of structures which may be built, including their bulk, density, placement, and setback requirements, as well as other land-use provisions. The BZA handles requests for variances to the Zoning Code. The CPC reviews site plans for all new construction.

The Landmark Commission promotes and maintains the historic features of the City through the landmark designation of important properties and through education and awareness initiatives. Homes which have been designated as landmarks are subject to review by the Landmark Commission when exterior changes are proposed.

The Planning and Development Department also administers Housing Assistance Programs, including grants, low-interest loans, and technical assistance for maintaining the City's housing stock.

Building Department

The Building Department issues building permits for new construction and alterations, as well as permits for plumbing, HVAC, electrical work, and demolition. Repairs to sidewalks and driveways, construction of fences, remodeling and renovation of the interior or exterior of a home, repair and replacement of chimneys, brickwork, blaststripping, and windows all require permits from the Building Department. In addition, the Building Department registers all contractors who do work in the City.

Housing Inspection Department

The Housing Inspection Department conducts point-of-sale inspections, exterior inspections, exterior and common area inspections of apartment buildings, and complaint-initiated inspections.

Getting Your Project Approved

To get an exterior alteration or an addition approved by the City, you must first submit plans for the project to the Planning and Development Department for consideration by the Architectural Board of Review (ABR). Submission requirements vary with the type of alteration or construction proposed. The Planning Department will give you a packet of information which explains the submission requirements for your project. Typically, the ABR will need to see drawings of the walls which will be changed (the elevations), a site plan which shows the footprint of the house and where it is situated on the lot, and construction details. Drawings must be to scale and have all dimensions indicated. You must also submit color photographs of the house and the site. The ABR meets twice a month, in the morning, and you or your representative must be present to discuss your project with the Board. There is a fee to appear before the Board.

Before you submit drawings to the Planning Department for review by the ABR, you must contact the Building Department to discuss Building Code requirements and the permitting process. Then you may submit your drawings to the Planning Department which will put your project on the next ABR agenda. The drawings will also be examined by the Zoning Administrator to determine if any variances from the Zoning Code will be needed to complete your project. The Zoning Administrator also determines if your project needs to be reviewed by the City Planning Commission. If any action is required in these areas, you will be contacted by the Zoning Administrator who will schedule you to appear before the Board of Zoning Appeals (BZA) or the City Planning Commission (CPC). The BZA and CPC meet together once a month in the evening. There is a fee to appear before the BZA/CPC.

If your home is a locally designated landmark, you will be contacted by Planning Department staff to appear before the Landmark Commission. The Landmark Commission, which meets once a month, will review your project to determine if any exterior changes proposed are compatible with your home's historic character. There is no fee to appear before the Landmark Commission.

Once your project is approved by the ABR, a separate application must be made to the Building Department for a building permit. The fee for a building permit is based on the size and type of project. As part of the permit process, the Building Department may have the Health and Fire Departments review your plans for conformance with the Health and Fire Codes, and the Building Department will also inspect the project to see that it conforms to the approved plans.

If you have questions about approvals or permits for your project, consult the chart on the next page. You may also call the Planning Department or the Building Department for further assistance.

REQUIRED APPROVALS

TYPE OF WORK	BUILDING PERMIT REQUIRED	ARCHITECTURAL BOARD OF REVIEW APPROVAL REQUIRED	ZONING APPROVAL REQUIRED
Air Conditioners	Yes	No	Yes
Chimney Replacement	Yes	May be Needed	No
Decks	Yes	Yes	Yes
Drains: Floor, Sewer, and Yard	Yes	No	No
Driveway Aprons	Yes	No	May Be Needed
Driveway Replacement	Yes	No	May Be Needed
Driveway Resurfacing	Yes	No	No
Door Replacement	Yes	Yes	No
Exterior Electrical Light Outlets	Yes	No	No
Fences	Yes	May Be Needed	Yes
Freestanding Masonry Walls	Yes	Yes	Yes
Garage Floors	Yes	No	No
Garages-New	Yes	Yes	Yes
Gutters and Downspouts	No	May Be Needed	No
Landscaping	No	No	No
Painting-Exterior	No	No	No
Paint Removal	Yes	No	No
Patios	Yes	No	Yes
Porch Repairs-Structural	Yes	No	No
Porch Replacement	Yes	Yes	Yes
Re-siding	Yes	Yes	No
Roofs/Re-roofing	Yes	Yes	No
Room Additions	Yes	Yes	Yes
Sidewalks-Private	Yes	No	No
Sidewalks-Public	Yes	No	No
Steps-Replacement	Yes	Yes	No
Storm Windows	No	No	No
Swimming Pools	Yes	No	Yes
Waterproofing Foundations	Yes	No	No
Window Replacement	Yes	Yes	No

Pro-Integrative Services

The Pro-Integrative Services Department provides home maintenance consultations to sellers and landlords to facilitate sales or leasing and to encourage the improvement of the City's housing stock. The Department also conducts maintenance workshops for the owners of two-family homes.

This section provides guidelines for assessing maintenance and repair projects and for determining whether you should try to tackle them yourself or hire a professional. It also includes general criteria to use when selecting a professional architect or contractor.

Should You Do It Yourself?

Substantial or highly technical work often requires professional expertise. Hiring a skilled contractor or architect may save time and money in the long run. In some cases, however, you may consider completing the project yourself, especially if you are handy around the house or if the project is relatively simple. Typical do-it-yourself projects include simple plumbing repairs, gutter repairs, siding repairs, and spot painting. Do-it-yourself projects make sense economically, provided that you don't try to tackle a project that is beyond your capabilities.

When deciding whether you should make a repair yourself or hire a professional, consider the following questions:

- What type of repair must be made?
- How much time will it take?
- How much will it cost?
- What is the extent of the repair?
- What are your actual or potential skills?
- Are standard types of materials required and are they readily available to you?
- How much money will you save if you do the work yourself?

When you begin a project, you make a commitment in terms of time and money. Do not expect that a contractor will be willing to finish a job you've started for substantially less than he or she would have originally charged. If you have any doubts about your ability to complete a project, hire a professional to do the work.

Hiring a Contractor

For many projects, the skills of a contractor will be necessary. All contractors who perform work for which a permit is required, and landscapers and exterior painters, must be registered with the Building Department.

There are two kinds of building contractors: tradesman and general contractors. Tradesman, also referred to as subcontractors, deal with specific types of work. They include carpenters, plumbers, painters, electricians, window and door installers, roofers, masons, and landscapers. If several subcontractors will be involved in a project, the presence of a general contractor to supervise and coordinate the entire project is essential. The general contractor acquires the necessary permits and approvals. He or she also schedules the arrivals and departures of the subcontractors. The general contractor is usually responsible for supplying all rough and finish materials. In addition, he or she may provide the plans and working drawings for the project.

The best way to select a contractor is to ask for recommendations from neighbors and friends who have completed similar projects. Other sources for referrals include architects, professional contractor organizations, building supply companies, and the Better Business Bureau. The Center for Housing and Community Life and the Onaway, Sussex, and Moreland on the Move Community Organizations each maintain a list of contractors for referral. These lists are based on the experiences of other Shaker Heights homeowners with particular contractors.

Interview potential contractors and try to determine if they will be willing and able to facilitate your improvement needs and desires. Check references and visit other jobs completed by the contractor. Investigate whom the general contractor will hire for the job. Will he or she hire skilled craftsmen or assistants and apprentices? Early in the process, try to get a general estimate of the costs and the time it will take to complete the job.

Homeowners sometimes act as their own general contractors, especially if the project has a limited budget or if the work must be staged over a long period of time. Be advised, however, that you should only act as the general contractor if you are familiar with the construction industry and have the time to spend supervising the work.

If you decide to act as your own general contractor, take special care in selecting subcontractors. References are essential to verify a subcontractor's reliability and the quality of his or her work. One important item to consider and investigate is your potential insurance responsibilities. As a general contractor, you will have to investigate whether subcontractors are covered by workman's compensation, liability, and property damage insurance. Also, you should check with your insurance agent to determine if any work done on your home will affect home and fire insurance policies.

Hiring an Architect

In some situations, the scope and scale of a job require an architect. The main role of an architect is to act as an agent for the owner so that all work is designed and built properly. The first phase of the architect-homeowner relationship is the design development phase. Steps involved in this early stage include an assessment of the existing condition of the house and of the homeowner's lifestyle.

The architect then will be ready to begin developing preliminary floor plans and sketches of the exterior building facades. Initial drawings often are revised before the architect produces the detailed drawings which will be used by the contractor to perform the work. The final drawings will be accompanied by specifications and a cost estimate. The architect will also develop a time frame and a detailed budget for the project.

The architect should assist in the selection of a contractor. After a contractor has been selected, the architect may be retained as the construction supervisor, which includes monitoring the quality of the work and seeing that it progresses

on schedule. Other functions that the architect may perform include investigating the need for various permits and approvals necessary for the job. An architect also may be hired only as a consultant for specific aspects of a project, such as when renovations to an interior may affect the exterior appearance of a home, or when structural concerns arise.

In general, you should use the same guidelines for selecting an architect as for selecting a contractor. Select an architect with whom you are comfortable and whose design solutions you admire. Request interviews with prospective architects. Ask them how they would approach your project and how they would facilitate your involvement. Try to gain a sense of their interest in the proposed project during the course of the interview. Contact neighbors who have completed work similar to what you have in mind and ask for references. Other sources for references include contractors and the local chapter of the American Institute of Architects (AIA).

Glossary of Architectural and Construction Terms

Ashlar. Squared building stone.

Balustrade. A railing system consisting of a top rail, a series of vertical supports (balusters), and a bottom rail.

Bay. The regular division of the façade of a building, usually defined by windows or other vertical elements.

Capital. The upper portion of a column or pilaster.

Casement Window. A window sash which swings open along its entire length, on hinges fixed to the side of the opening into which it is fitted.

Caulking. A resilient mastic compound used to seal cracks, fill joints, prevent leakage, and/or provide waterproofing.

Clapboards. Wood siding used as an exterior covering on a building of frame construction, applied horizontally and overlapped.

Column. A vertical, load-bearing architectural element.

Coping. A protective cap or cover on a wall, parapet, pilaster or chimney, built of stone, terra cotta, concrete, metal or wood.

Corbel. A masonry projection or series of projections, each stepped progressively further forward and anchored in a wall, column or chimney.

Corner Board. A board which is used as trim on the external corner of a wood frame structure.

Cornice. A decorative projection or series of moldings normally found at the connection between an exterior wall and a roof.

Dentils. Small, block-shaped projections below a cornice.

Dormer. A structure projecting from a sloping roof, usually housing a window.

Downspout. A pipe for directing rain water from the roof to the ground.

Drain Tile. Pipe which carries ground water away from the foundation of a building.

Eaves. The lower part of a roof which projects beyond the walls of a building.

Efflorescence. A white powder composed of soluble salts which appears on masonry surfaces; caused by moisture leeching through mortar joints.

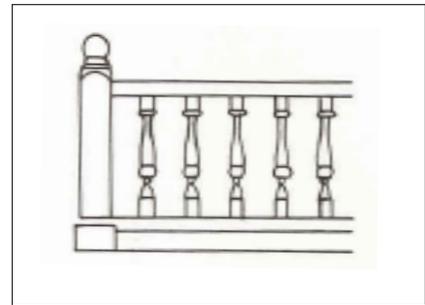
Elevation. The front, side, or rear of a building viewed straight on.

Exfoliation. Peeling, swelling or scaling of stone in thin layers, caused by weathering, chemicals or heat.

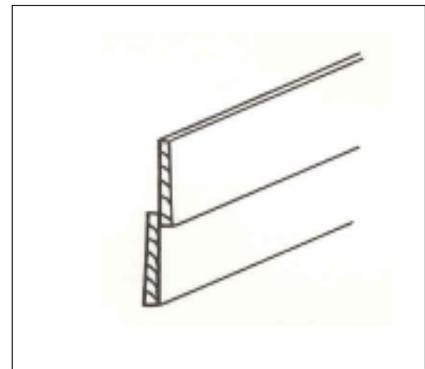
Façade. Any face of a building, but most often the front face.

Fanlight. A semicircular window with radiation bars in the form of an open fan.

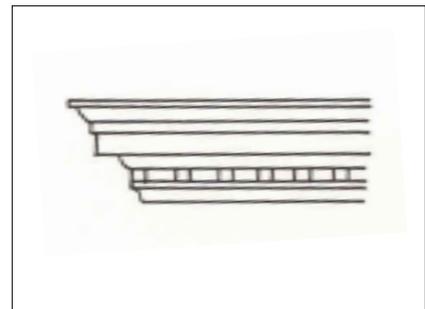
Fascia. Any flat, horizontal member with minimal projection.



Balustrade



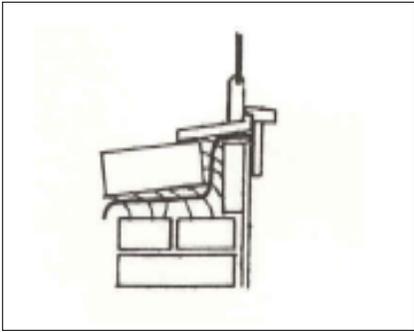
Clapboards



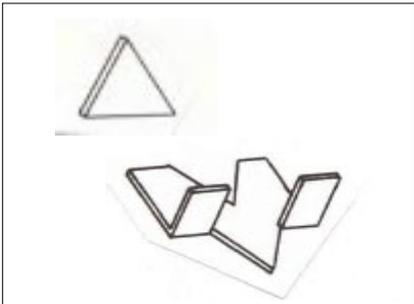
Cornice with Dentils



Fanlight



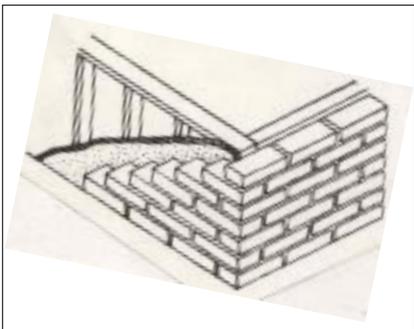
Flashing



Glazier's Points



Half-Timbering



Masonry Veneer

Flashing. A thin, impervious material used to prevent water penetration and provide drainage, especially between a roof and a wall, and over or under door openings and windows.

Flue. An incombustible and heat-enclosed passage in a chimney which vents a fireplace, furnace or boiler.

Footing. The part of a building's foundation which rests directly on the soil.

Foundation. The base of a building or the part of the building upon which the superstructure rests.

Gable. The upper, usually triangular portion of a wall, having a double-sloping roof. The gable extends from the eaves to the ridge of a roof.

Gambrel Roof. A roof which has two pitches, with the lower slope being much steeper.

Glazier's Point. A small, thin piece of metal used to hold a piece of glass in a window frame while glazing compound is being applied.

Glazing Compound. A heavy past or putty used to hold window glass in place.

Grade. The ground level at the outside walls of a building, or elsewhere on the building site.

Grout. A very thin mixture of mortar or cement and water which can be poured, troweled or pumped into masonry joints and cracks.

Guy Wire. A supporting rope, cable or wire which is anchored at one end and tied to an antenna in order to stabilize it.

Half-Timbered. A term which describes walls in which the wooden framework, or a decorative representation of the framework, is exposed and the surface between the wooden members filled in with stucco or brick.

Hipped Roof. A roof which slopes upward from all four sides.

Jamb. A vertical member on either side of a door or window frame.

Joist. One of a series of parallel beams laid on edge which support floors and ceilings.

Lintel. A horizontal structural member which spans an opening and carries the weight of the wall above it.

Mansard Roof. A roof which has two pitches on all four sides, with the lower slope being much steeper.

Masonry. Stone or brick work.

Masonry Veneer. An exterior wall facing of brick or stone which provides a decorative, durable surface but is not load-bearing.

Mortar. A mixture of cement, lime, sand, and water which is troweled into a workable state and used to fill the cracks or gaps between bricks or stones.

Mullion. A vertical member separating (and often supporting) windows and doors set in series.

Muntin. A secondary framing member which holds individual panes within a window; also called a glazing bar.

Nosing. The projecting edge of the flat surface (tread) of a step.

Oriel. A bay window which projects from the wall of an upper story.

Palladian Window. A large window, divided by columns or piers into three lights. The central light is arched and wider than the two flanking lights.

Parapet. A low wall which rises above a roof line, terrace, balcony or porch.

Patina. Surface color and texture that develops as a result of age, exposure or use.

Pediment. In classical architecture, the triangular gable end of the roof above a horizontal cornice.

Pilaster. An engaged pier or pillar, often with a capital and base.

Plumb. Exactly vertical.

Quoins. Brick or stone used on masonry walls to reinforce a corner or an edge; often decorative.

Rafters. A series of inclined supporting members to which a roof covering is affixed.

Rake. The junction between the roof and a wall at a gable end.

Riser. The vertical part of a step.

Roof Ridge. The uppermost edge of a roof.

Roof Valley. The trough formed by the intersection of two inclined roof planes.

Sandblasting. An abrasive cleaning method which uses compressed and powdered quartz. Glass beads, walnut shells or other materials to forcefully remove built-up layers of paint; the process is best suited for iron and steel, but harmful to wood, masonry, terra cotta, and thin gauge metals.

Sash. The frame which holds the glass in a window.

Shake. A thick, hand-split shingle or clapboard with tapered radial form.

Sheathing. The covering placed over the exterior studs and rafters of a wood-framed building.

Sill. The lowest horizontal member of a window frame.

Soffit. The exposed underside of any overhead component of a building, such as an arch, balcony, beam, cornice, lintel or eave.

Spalling. The flaking or chipping of brick, stone or cement due to weathering, chemical action or settling.

Splashblock. A stone or concrete block placed on the ground under a downspout to divert roof drainage away from the foundation of a building so as to prevent moisture damage and erosion.

Stringer. In a stair, the inclined board which supports the ends of the steps.

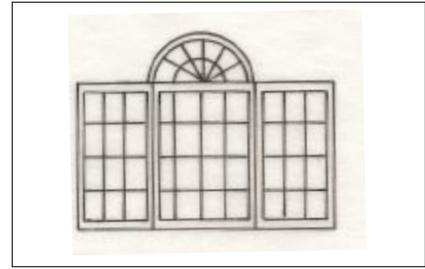
Stucco. A textured exterior finish, usually composed of cement, lime, and sand which are mixed with water and applied wet.

Tread. The horizontal surface of a step. (See Riser)

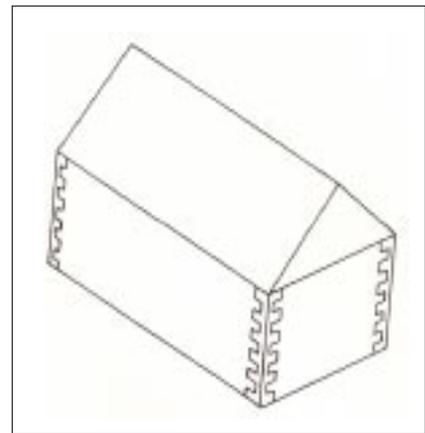
Trim. The decorative parts of a building that finish or cover construction joints and changes in materials.

Turret. A tall, slender tower.

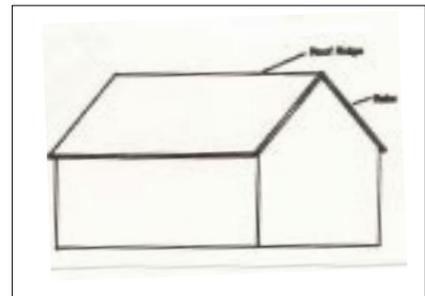
Vapor Barrier. A moisture impervious layer or coating which prevents the passage of moisture or vapor into a material or structure.



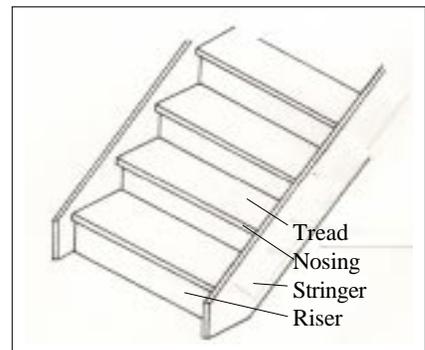
Palladian Window



Quoins



Roof Ridge and Rake



Riser, Tread, and Stringer

Resource Listing

Books

- Better Homes and Gardens. The Complete Guide to Home Repair, Maintenance, and Improvement. (Des Moines, Iowa: Meredith Corp., 1980).
- Better Homes and Gardens. Step by Step masonry and Concrete. (Des Moines, Iowa: Meredith Corp., 1982).
- Brangam, Suzanne. Housewise. (New York: Potter, Inc., 1987).
- City of Oakland Planning Department. Rehab Right. (Oakland, CA; City of Oakland Planning Department, 1986).
- Constable, George, ed. Time-Life Books Complete Home Repair Manual. (New York: Prentice Hall Press, 1987).
- Demske, Dick. The Home Repair Book. (New York: Consolidated Book Publishers, 1978).
- Evers, Christopher. The Old House Doctor. (Woodstock, NY: The Overlook Press, 1986).
- Frankel, William, ed. Adding On. (Alexandria, VA: Time-Life Books, 1979).
- Frankel, William, ed. Roofs and Siding. (Alexandria, VA: Time-Life Books, 1979).
- Geary, Don. The Complete Handbook of Home Exterior Repair and Maintenance. (Blue Ridge Summit, PA: TAB Books, Inc., 1982).
- Hamilton, John S. M. Discover Your Dream House: It Could Be the House You're Living in Now. (Crozet, VA: Betterway Publications, Inc., 1982).
- Hand, Jackson. Complete Book of Home Repairs and Maintenance. (New York: Popular Science Publishing Co., 1971).
- Hanson, Shirley, and Nancy Hubby. Preserving and Maintaining the Older Home. (New York: McGraw-Hill, 1983).
- Harmon, A. H. The Guide to Home Remodeling. (New York: Grosset & Dunlap, 1972).
- Heldmann, Carl. Manage Your Own Renovation. (Pownal, VT: Storey Communications, Inc., 1987).
- Holtje, Herbert F. Handbook of Exterior Home Repairs: A Practical Illustrated Guide. (West Nyack, NY: Parker Publishing Company, Inc., 1979).
- Jackson, Albert, and David Day. Popular Mechanics Home How-To. (New York: Hearst Books, 1989).
- Jones, Peter. Building On: A Homeowner's Bible. (Garden City, NY: Doubleday & Company, Inc., 1981).
- Jones, Peter. Outdoor Home Repairs Made Easy. (New York: Butterick Publishing, 1980).
- Kangas, Robert. The Old House Rescue Book: Buying and Renovating on a Budget. (Reston, VA: Reston Publishing Company, Inc., 1982).
- Kramer, Jack. Fences, Walls and Hedges for Privacy and Security. (New York: Scribner's and Sons, 1975).
- Kreh, Richard T. Masonry Projects and Techniques. (New York: Popular Science Books, 1985).
- Knox, Gerald M. Garages, Basements, and Attics. (Better Homes and Gardens Books, 1985).
- Labine, Clem, ed. The Old-House Journal Compendium. (Woodstock, NY: The Overlook Press, 1980).
- Lester, Kent. The Complete Guide to Remodeling Your Home. (White Hall, VA: Betterway Publications, 1987).
- Logsdon, Gene. The Low Maintenance House. (Emmaus, PA: Rodale Press, 1987).
- McCormick, Dale. Housemending: Home Repair for the Rest of Us. (New York: E.P. Dutton, 1987).
- McGowan, John, and Roger DuBern. The Outside Handyman. (New York: Arco Publishing, Inc., 1984).
- Miller, Carol Poh. The Cleveland Old House Handbook. (Cleveland, OH: Neighborhood Housing Services of Cleveland, Inc., 1979).

Nunn, Richard V. Home Improvement/Home Repair. (Passiac, NJ: Creative Homeowner Press, 1980).
Orem, Alan D. Reviving Old Houses. (Pownal, VT: Storey Communications, Inc., 1989).
Poore, Patricia, and Clem Labine. The Old-House Journal New Compendium. (Garden City, NY: Doubleday & Company, Inc., 1983).
Ramsey, Dan. Home Improvements: 52 Easy Weekend Projects. (Blue Ridge Summit, PA: TAB Books, Inc., 1989)
Reilly, H. Edward. Introductory Horticulture.
Shepherd, James M. How to Contract the Building of Your Home. 2nd ed. (Williamsburg, VA: Shepherd Publishing, 1984).
Stephen, George. New Life for Old Houses. (Washington, DC: Preservation Press, 1989).

Videos

“Window Glass and Sash Cords,” “Installing Attic Insulation,” “Asphalt Driveway Repairs,” “Plumbing,” “Masonry Repairs,” “Wall Framing.” Heights Community Congress Video Series. CH-UH Library.
“Walls,” “Attic Conversion,” “Interior Projects,” “Plumbing and Electrical Repairs,” “Energy Conservation,” “Floors and Ceilings,” “Exterior Projects.” Home Improvement Video Series. CH-UH Library.
“Interior Paint and Wall Paper,” “Common Home Repairs,” “Weatherization and Insulation,” “Ceramic Tile,” “Dry wall,” “Patios and Walkways,” “Exterior Painting.” Hometime Video Series (PBS). City of Shaker Heights Building Department.
“Porches,” “Exterior Repairs, Concrete.” Home Again Video Series with Jim LaRue of the Housing Resource Center. CU-UH Library.

Organizations and Agencies

American Institute of Architects, Cleveland Chapter. The Arcade, Cleveland, Ohio 44113; 721-1240. (*For Architect Referrals*).

Council on Hazardous Materials. 1223 West Sixth Street, Cleveland, Ohio 44113; 861-6945. (*Pesticide and Herbicide Information*).

Housing Resource Center. 1820 West 48th Street, Cleveland, Ohio 44102; 281-4663. (*Home Maintenance Publications and Advise, Workshops*).

National Pesticides Telecommunications Network – A division of the Environmental Protection Agency; (800) 858-PEST. (*Lawn Care Chemical Information*).

The Onaway Community Organization, c/o The Shaker Heights Community Services Department, 491-1330.

Shaker Heights Building and Housing Inspection Department, City Hall, 3400 Lee Road, Shaker Heights, Ohio 44120; 491-1460. (*Building, Electrical, Plumbing, and Fence Permits, Housing Inspections*).

Shaker Heights Community Services Department, 3380 Lee Road, Shaker Heights, Ohio 44120; 491-1330. (*Home Maintenance Consultations, Homeowners’ Cooperative, Contractor Referrals*).

Shaker Heights Department of Planning and Development, City Hall, 3400 Lee Road, Shaker Heights, Ohio 44120; 491-1430. (*Architectural Board of Review, Board of Zoning Appeals, City Planning Commission, Landmark Commission*).

Shaker Heights Public Works Department, 15600 Chagrin Boulevard, Shaker Heights, Ohio 44120; 491-1490. (*Tree Removal, Dutch Elm Disease Information, Compost Poile Permits, Public Sidewalk Maintenance*).

Other Sources

The Housing Resource Center. Housemending Notebook, Your Home (*Newsletter of the Housing Resource Center*),
Housemending Resources (*Quarterly publication*).

The Plain Dealer. Home Improvement Guide (*special supplement, appears yearly*).

Shaker Heights Public Library. "Homeowner's Resource to Home and Garden Improvements." (*List of recommended titles*).

Simple Home Repairs Outside. Item #190L. (*Order from the Consumer Information Center, Pueblo, Colorado 81009*).

Home Inspection Checklist

Exterior Walls

- Do brick or stone walls have cracks or loose joints?See Repair Sheet D
- Is stucco cracking, spalling or separating?See Repair Sheet D
- Do any surfaces require repainting?See Repair Sheet H
- Is wood siding loose, damaged or decayed?See Repair Sheet E
- Is any trim loose or missing?See Repair Sheet E
- Does any wood show signs of termite infestation?See Repair Sheets E & O
- Is caulking material missing from the joints between dissimilar materials.....See Repair Sheet F
- Is synthetic siding dented, scratched, torn or mildewed?See Repair Sheet F

Roof and Gutters

- Are large areas of the roof damaged, deteriorated or leaking?See Repair Sheet A
- Are any shingles damaged or loose?See Repair Sheet A
- Is asphalt roofing blistered or cracked?See Repair Sheet A
- Are there any water stains or signs of dampness on the underside of the roof?See Repair Sheet A
- Are gutters, vents, and/or louvers clogged with leaves and debris?See Repair Sheet C
- Do the gutters leak?See Repair Sheet C
- Are the downspouts bent or loose?See Repair Sheet C
- Do fascia and soffits need to be repaired or repainted?See Repair Sheet H
- Are antenna guy wires and supports loose or disconnected?See Repair Sheet P
- Are masonry chimneys cracked or leaning?See Repair Sheet B
- Is flashing rusty or missing, especially around chimneys or in roof valleys?See Repair Sheets B & C
- Do gutters and downspouts need to be repainted?See Repair Sheet H

Foundations and Basement

- Does the slope of the ground prevent water from draining away from the house? ..See Repair Sheet O
- Is there any leakage in the basement following wet weather?See Repair Sheet O
- Is the basement or crawl space damp due to inadequate ventilation?See Repair Sheet O
- Is any wood near the ground soggy or crumbling?See Repair Sheet O
- Are any insect tunnels or bore holes visible?See Repair Sheet O

Exterior Stairs

- Are wooden stairs rotted, worn or deteriorated?See Repair Sheet N
- Do brick stairs need to be re-pointed?See Repair Sheet D
- Do brick or concrete stairs have noticeable cracks?See Repair Sheet N

Windows and Doors

- Do doors, windows or trim need to be repainted?See Repair Sheet H
- Do any windows have loose glazing compound?See Repair Sheet G
- Do any windows have broken glass or damaged screens?See Repair Sheet G
- Do doors or windows stick or refuse to open completely?See Repair Sheet G
- Is weatherstripping damaged or loose?See Repair Sheet G
- Do doors, windows or other openings lack proper caulking?See Repair Sheet G
- Are doors and windows not lined up squarely in their frames?See Repair Sheet G

Electrical System

- Is any exterior wiring damaged?See Repair Sheet P
- Do any exterior fixtures have exposed bulbs or wires?See Repair Sheet P
- Do any exterior sockets lack covers?See Repair Sheet P

Yard and Vegetation

- Have debris or leaves accumulated in storm drains or window wells?See Repair Sheet O
- Are driveways and sidewalks cracked or heaved?See Repair Sheets J & K
- Are tree roots pushing up under sidewalks?See Repair Sheets J & K
- Are sidewalks more than one inch out of alignment?See Repair Sheet J
- Do sidewalks or driveways have cracks wider than one inch?See Repair Sheets J & K
- Are trees and shrubs diseased, discolored or dead?See Repair Sheet R
- Do trees and shrubs require pruning?See Repair Sheet R
- Do fences need to be repaired or repainted?See Repair Sheet L
- Are any freestanding walls leaning, cracked or falling over?See Repair Sheet M
- Do wood decks show signs of deterioration, rot or insect infestation?See Repair Sheet I

Porches

- Are beams and columns rotted or deteriorated?See Repair Sheet I
- Are any floor or ceiling boards loose or missing?See Repair Sheet I
- Is there any insect damage under porches or steps?See Repair Sheet I
- Does any of the wood near the ground appear spongy or rotted?See Repair Sheet I

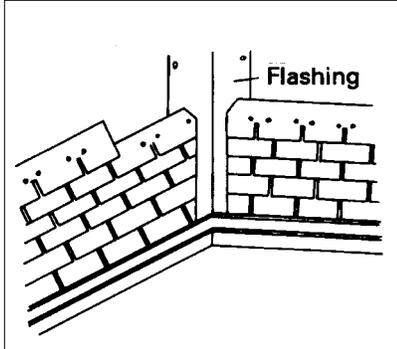
Garages

- Does the garage need to be repainted or re-roofed?See Repair Sheet Q
- Are the foundation walls or the floor slab cracked?See Repair Sheet Q
- Are the studs or sill plates rotten?See Repair Sheet Q
- Does the garage door get stuck in its track or is it difficult to open?See Repair Sheet Q

REPAIR SHEET A

Roofs

Inspection



Check roof valleys for damage to flashing.

Inspect roofs every fall and spring, at a minimum. Check for cracked broken, worn or curling shingles. Most roof leaks are caused by damaged or worn shingles or by rusted metal flashing. Patch or replace torn, loose shingles and rusty or corroded flashing to avoid leaks.

Prune overhanging tree limbs to reduce wear to roofing materials and to prevent moss build-up on the roof. Increased sunlight dries the roof deck and prevents the growth of moss and mildew.

When heat escapes through the ceiling to the roof, the snow melts on the roof's surface and is trapped by unmelted snow, forming ice dams. The trapped water leaks through the roof's sheathing and into the soffits and the house. To avoid ice dams and water leakage insulate ceilings and provide soffit ventilation so that the roof stays cold. With a cold roof, snow will melt from the top down, reducing the formation of ice dams.

Consider installing heating cables along the eaves to reduce roof damage due to ice. Cables are clipped to shingles in a zig-zag pattern along the eaves and plugged into an outside outlet. They help prevent the formation of ice dams along the eaves which can damage shingles and gutters. Cables do not always solve the problem, however, because secondary ice dams can form behind them. The best solution is an attic and soffit ventilation system. The ventilation system draws the trapped heat out of the attic so the roof remains cold.

Problem Assessment

To find the cause of a roof leak, first locate the leak. Check the attic for water on the rafters and sheathing. Place a bucket under the dripping water. Trace the water to its source and mark its location. When the roof is dry, attempt to find the leak in the area over the mark. Look for stains or discoloration of decking and rafters. When you find the leak, you will know its cause and what needs to be repaired.

Should You Do It Yourself?

If you are comfortable on the roof, you may be able to do spot repairs, such as replacing damaged shingles or flashing. Be careful not to damage the roof by walking on it excessively. Slate and tile roofs are especially likely to be damaged in this way.

Approval from the City

No approvals or permits are needed to do minor spot repairs. However, you may not replace more than 25% of an existing roof unless you replace the entire roof. A building permit is required for a new roof and you must receive approval from the Architectural Board of Review (ABR). Contact the Planning Department for approved materials and colors.

The Building Code requires that all replacement roofing material must have at least a 30 year rating.

Your roofer is responsible for obtaining a building permit and for scheduling the necessary inspections. Contact the Building Department for more information.

Design Considerations

The roof of an old house is one of its most prominent architectural features. Replacement shingles should be the same material, color, size, shape, and texture as the existing shingles. When replacing an entire roof, keep in mind that darker colored shingles usually look better than lighter colored ones.

Wood and slate roofs add character and texture to a house. Every attempt should be made to repair or restore existing slate or wood shingles.

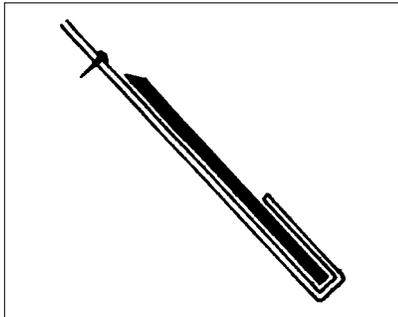
Tools Needed For Repairs

Flashlight, hammer, bucket, shingle hook, pry bar, new shingles, galvanized roofing nails, roofing mastic, roofing cement, fiberglass mending kit.

How to Complete the Repair

Replacing wood shingles: Remove damaged shingles by cutting the nails with a hacksaw. Cut each new shingle to the same size as existing shingles. When nailing shingles in place, match the pattern of the surrounding shingles.

Replacing slate shingles: Remove all broken shingles. Drill holes into the new slate shingles to match the holes in the existing shingles. Nail each new shingle into position. Nail a 1-1/2" wide copper or aluminum strip below each shingle and bend it to hold the shingle in place. Follow the pattern of the surrounding roof. Ask your roofing supplier for additional tips and information.



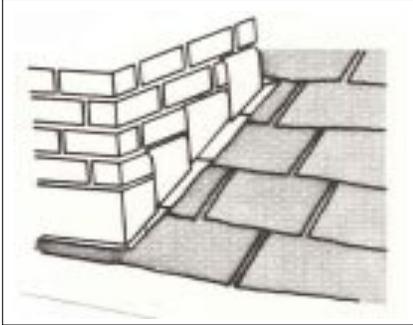
Slate shingles are held in place by a metal strip nailed to the roof deck.

Replacing asphalt shingles: Remove damaged shingles with a utility knife. Use a slim pry bar to remove the nails holding the shingles. Cover the area being repaired with roofing cement, overlapping adjacent shingles areas. Place each new shingle in the roofing cement and secure it with galvanized roofing nails. Drive the nails near each side and at the top of each slat on the new shingle. Dab roofing cement or mastic over each nail head and press the single flat.

Repairing metal flashing: Sand rusty sections of flashing. Next, patch holes with an automotive fiberglass mending kit, following the manufacturer's directions. Let the fiberglass patch harden, then apply additional coats of resin, if necessary. Let the resin set hard. Sand the patched area and apply a coat of rust-proof paint. Using roofing mastic, caulk all edges where flashing and shingles meet.

For More Information...

[Outdoor Home Repairs Made Easy](#) – repairing flashing and hip ridge shingles.
[The Old House Rescue Book](#) – repairing flat roofs, metal roofs, and slate roofs.
[Handbook of Exterior Home Repairs](#) – patching flat roofs, replacing flashing.
[Everyday Home Repairs](#) – fixing a leaky roof.
[Time/Life Books Complete Home Repair Manual](#) – repairing a rotted cornice and other roof repairs.
[Home Repairs: 52 Easy Weekend Projects](#) – replacing asphalt and wood shingles, repairing leaky roofs.
[The Old-House Journal Compendium](#) – repairing slate, wood, and flat roofs.
[Home Improvements: 52 Easy Weekend Projects](#) – venting an attic.
[Jackie's Home Repair and Maintenance Charts](#) – repairing roof leaks, replacing wood, slate, and asphalt shingles.

Inspection

Chimney Flashing.

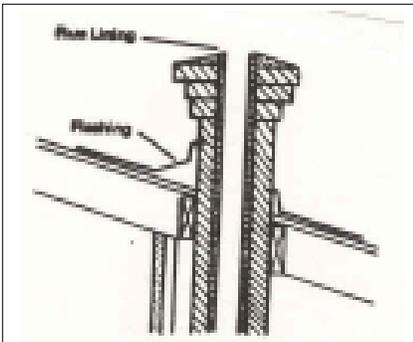
Inspect and clean chimneys at least once a year; more frequently if sooty fuels are burned. If the chimney fails to function properly or is clogged, the gases will smother the fire or keep it from burning properly. A creosote build-up can also become a fire hazard.

Check the flashing around the chimney. If the flashing is rusty or missing, roof leaks may develop around the chimney.

Check all masonry around the stove pipe opening and at the intersection between the chimney and the furnace flue. Repair any leaks with furnace cement so that the draft will not be impaired.

If there is a clean-out door at the base of the chimney, keep it tightly shut, and check it from time to time to make sure that it fits tightly.

Make a visual inspection of the chimney with a flashlight and a mirror at the clean-out door in the base. Look for cracks and breaks in the flue lining, loose pieces of flue tiles, or large deposits of soot.

Problem Assessment

Chimney cross section.

Weather and time will cause mortar to weaken and deteriorate. When you notice that mortar is missing, check the entire chimney and mark all places with chalk where mortar should be replaced.

When smoke escapes from a chimney between the bricks, it has had to penetrate the flue lining first. It is not enough to simply apply mortar to the brick joints because the problem lies within the chimney. Do not use the chimney until a professional chimney sweep or mason has checked the flue lining for cracks.

A chimney sweep may use a video camera to scan the flue lining. This process can locate cracks in the flue lining that might not be found through a visual examination.

Should You Do It Yourself?

The safest and most effective way to handle chimney repairs and maintenance is to hire a professional chimney sweep or mason. If you have experience with masonry work, you might consider repointing small areas of crumbling mortar and replacing loose chimney bricks. It is also relatively easy to clean your own chimney, although a chimney sweep can handle this job very efficiently using a special vacuum.

If you see smoke escaping between bricks of your chimney, the flue lining in your chimney may be cracked. Call a professional to make an evaluation and do the repair work.

The best way to handle a leaning chimney is to call a professional mason because the job is very difficult and dangerous.

If a chimney is in generally poor condition, call a professional to examine the structure and determine whether it can be repaired safely or should be replaced.

Approval from the City

A building permit is required to replace a chimney.

If the size, location or design of a chimney is to be changed, it must be approved by the Architectural Board of Review before a building permit is issued.

Design Considerations

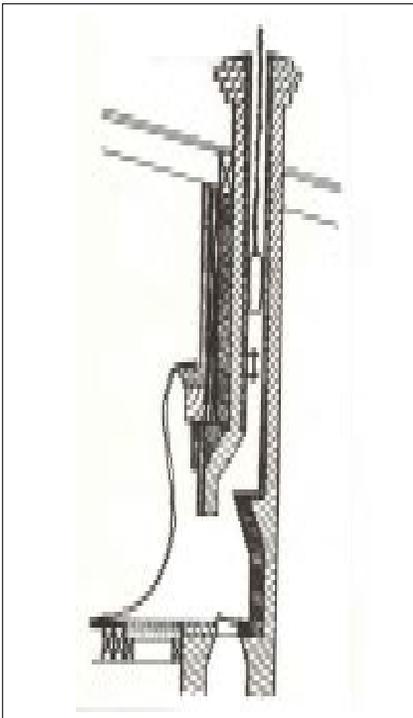
A replacement chimney should be the same style as the existing chimney so that the original architectural character of the house is not altered.

New mortar should match the old mortar in composition, color, and texture. The size and shape of the new joints should match the old ones. Mortar with a high lime content is usually suitable for old brick, but for the best results, you should try to replicate the composition of the existing mortar. Try to find replacement bricks that will match the color and texture of the chimney as closely as possible. Reuse existing bricks, if possible.

Tools Needed for Repairs

Rope, burlap bag filled with rags, sawdust or straw, wire brush, hammer, cold chisel, brush, trowel, dowel, mortar mix.

How to Complete the Repair



Cleaning a chimney.

Replacing chimney mortar: Use a chisel to chip away all loose mortar. Remove old mortar to a depth of at least ½". Clean away the loose rubble and dust. Wet the area to receive new mortar. Mix the mortar, using one part masonry cement to three parts sand. Add mortar color, if necessary, to make the new mortar slightly darker than the existing, so the new mortar will match when it dries. Apply the mortar with a trowel. Copy the finishing strokes in the existing mortar with dowel.

Replacing a loose chimney brick: Remove the loose brick by hand, if possible, or use a small chisel and hammer to chip away the mortar and remove the brick. Be careful not to damage the brick. Chisel away any mortar attached to the brick. Remove any mortar from the hole left by brick. Clean away dust and rubble. Wet the hole and apply a layer of fresh mortar all around inside. Wet the brick and press it in place. When it is positioned correctly, re-point the joints.

Cleaning the chimney: First, make sure the damper in the fireplace and the door in the ash pit are closed tightly. Cover the fireplace opening with a piece of cloth to prevent soot and ashes from entering the room. Tie a weighted burlap bag to a rope that is a few feet longer than the length of the flue. Lower the bag into the chimney. Raise and lower the bag several times. Soot will fall to the bottom where you can remove it with a shovel and a hoe. If the debris contains chips of mortar, brick or concrete, this may be an indication that the flue lining has deteriorated. Call a professional mason or a chimney weep to make an assessment. To clean a stove pipe, disassemble it, and use a stiff brush remove the soot and creosote build-up.

For More Information...

Handbook of Exterior Home Repairs – cleaning and repairing a chimney, replacing flashing, mortar, and loose chimney bricks, testing for leaks, repairing a chimney cap.

Home Repairs: 52 Easy Weekend Projects – cleaning and inspecting a chimney.

Your Home, August 1990. (Newsletter of the Housing Resource Center) – removing chimney debris.

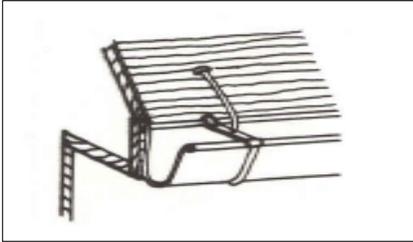
Time-Life Books Complete Home Repair Manual – resealing a chimney.

The Old-House Journal Compendium – repairing old chimneys, lining the flues, repairing fireplaces.

REPAIR SHEET C

Gutters and Downspouts

Inspection



Check for loose hanger straps.

Clean gutters and downspouts periodically, especially in the fall and spring.

If your gutters have leaf screens, clean the screens regularly.

Check the alignment of the drain system. Make sure that all joints between sections of gutters are tight and there are no sags.

Check carefully for loose nails or hanger strips on gutters and downspouts.

Make sure water is being conducted away from the house and that the downspouts drain into the storm sewer system.

Repaint wooden gutters every four or five years.

Problem Assessment

If water is spilling over the sides of your gutters, the gutters or downspouts may be clogged. Damp leaves will cause metal gutters to rust. Also, the weight of damp leaves will strain the supporting brackets and cause gutters to sag.

A loose bracket will interrupt the pitch of a gutter, causing water to pour over the sides. From the ground, it is difficult to see if the proper pitch is being maintained. The slope of the gutter should drop one inch toward the downspout for every sixteen feet of gutter length. To check a gutter's pitch pour water down the gutter. If any puddles remain in the gutter, the pitch must be adjusted.

Should You Do It Yourself?

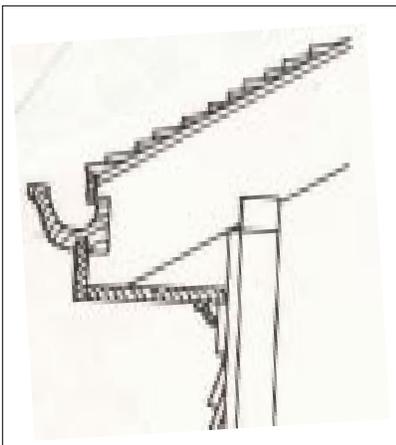
The basic repair and maintenance of metal gutters and downspouts do not usually require professional assistance. Gutter replacement, however, is best left to a professional. Rebuilding deteriorated wooden gutters can be quite expensive and will require professional expertise.

Approval from the City

By city ordinance, gutters and downspouts must be connected to the storm sewers. No gutters or downspouts may be connected to the sanitary sewers.

Changes to gutters must be approved by the Architectural Board of Review. An exception to this rule is a change from half-round to standard extruded gutters. This change does not require approval from the Board.

Design Considerations



Wooden gutter/box cornice system.

Wooden gutters, box cornices, and built-in gutters require more inspection and maintenance than standard aluminum gutters, but if your home has these important architectural features, you should make every effort to preserve them.

If your home has a built-in gutter/box cornice system, maintain or install soffit vents in the cornice. This will help dry out wooden gutters and help prevent ice dams.

Metal gutters should be painted to match the trim of the house.

When replacing metal gutters, consider installing bonded gutters, which are pre-finished and do not require painting.

Tools Needed for Repairs

Ladder, trowel, garden hose, guard, carpenter's level, replacement gutter section, roof mastic, fiberglass repair kit, rust-proof paint, hacksaw.

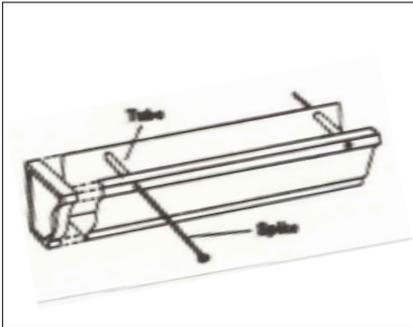
How to Complete the Repair

Unplugging gutters and downspouts: Using a trowel, clean leaves, twigs, and other material out of gutters. Flush the gutters with a garden hose.

Patching rust spots and small holes: Patch rust spots and small holes with a fiberglass repair kit. Brush the fiberglass resin onto the metal. Cover the resin with fiberglass fabric cut to fit. Let the resin harden slightly, brush on more, and let dry overnight.

Patching larger holes: Cut a section of matching gutter as a patch for a gutter section that has rusted through. Apply roofing mastic to the patch area and press the patch into place. Coat the repaired area with a metal primer. Let the primer dry. Then repaint the repaired area with a finish coat of rust-proof paint.

Repairing sagging wooden gutters: Push the gutter up at the point where water collects. Drive in any loose nails. If these nails no longer hold, re-nail about an inch away from the original nail holes. Fill the old holes with putty and repaint.



Gutters mounted with a spike and tube arrangement.

Repairing sagging gutters mounted with hanging straps: Remove the hanging straps and reposition the gutter. Bend the hanging straps and re-attach them so they hold the gutter in place. Fill the old nail holes with putty and repaint.

Repairing sagging aluminum gutters mounted with spike and tube arrangement: It is often possible to push up a little where the sag occurs, to reposition the gutter. If the sag is too great, take a sheet metal strap and attach one end to the outer edge of the gutter with sheet metal screws. Place the other end beneath the edge of the shingles and nail in place. The increased tension will take up the sag. Check the joints for leaks and repair with caulking or roofing cement.

Repairing dents in downspouts: Hammer out dents with a wooden mallet. If a section is so dented as to cause blockage, replace the section.

Repairing or replacing built-in gutters: Before you repair or replace a built-in gutter/box cornice system, photograph or sketch the system as originally constructed. Salvage and re-use as much of the original material as possible. Try to replicate the original design details when using new replacement materials.

Patching wooden gutters: Chisel out the bad wood. Soak the hole with a wood preservative. When the wood is dry, fill hole with plastic wood and smooth carefully until it conforms to the gutter profile. Give the repair a final protective coat of roofing cement. Paint or stain the repaired area to match.

Repainting wooden gutters: Remove the old paint with a wire brush. Treat the surface with a wood preservative and a coat of primer. Apply a paint or stain.

For More Information...

[The Old House Journal New Compendium](#) – fixing built-in and metal gutters.

[The Old House Rescue Book](#) – inspecting gutters and downspouts.

[Home Repairs: 52 Easy Weekend Projects](#) – cleaning and gutters and downspouts.

[Handbook of Exterior Home Repairs](#) – fixing sagging gutters.

REPAIR SHEET D

Inspection

Inspect masonry walls (brick, stone or stucco) for signs of cracking, bulging, spalling, and general deterioration. Uneven settlement can cause mortar to crumble and cracks to appear in bricks or stone.

Stucco may lose its grip on brickwork and fall off due to dampness in the underlying bricks or a faulty stucco mix. Using a light hammer, tap stucco in areas you suspect may have deteriorated. A hollow sound will reveal damaged stucco. Damaged areas should be cut back with a hammer and chisel to leave a sound edge, then patched with new stucco.

Problem Assessment

Repair crumbling mortar immediately to prevent more costly repairs later.

Repair defects in brickwork as soon as possible so that water cannot seep into the wall and cause more damage.

Should You Do It Yourself?

Masonry repairs, including patching cracks and repointing, can often be made without too much difficulty.

A masonry dealer or contractor can recommend a mortar mixture for repairs or a muriatic acid solution for cleaning.

If an entire area of stucco is cracking or bulging excessively, check with a contractor to determine possible causes. Ask for refinishing recommendations or have a professional do the work, especially if a large area must be replaced.

Approval from the City

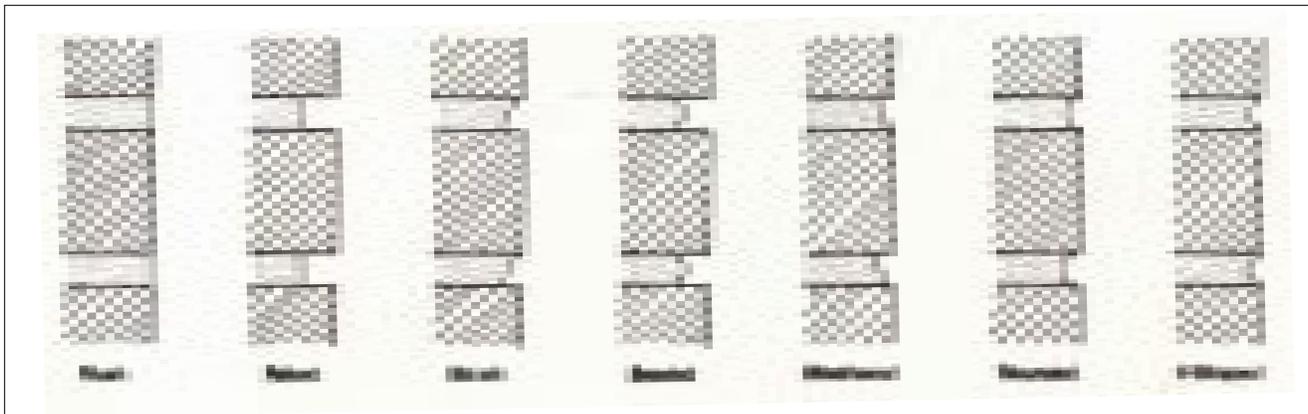
No permit or approval is needed to repair or maintain exterior walls.

Design Considerations

The color of a stucco patch should match the rest of the wall as closely as possible.

New mortar should match the old mortar in composition, color, and texture. The size and shape of new mortar joints should match the existing joints.

Re-use as many of the old bricks as possible or try to find old bricks which match the existing bricks.



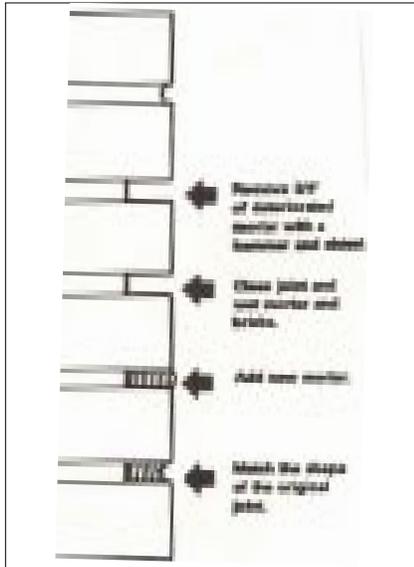
Masonry Joint Profiles

Masonry should never be sandblasted. Sandblasting exposes the porous inner layers of brick, causing rapid deterioration. Sandblasting also diminishes the sharpness and crispness of a building's edges and blurs architectural details.

Tools Needed for Repairs

Caulking, utility knife, caulk gun, smoothing tool (plastic spoon or flat stick), masonry chisel, hammer, mortar, pointed trowel, joint tool, muriatic acid, Portland cement, wooden dowel, steel float.

How to Complete the Repairs



Steps in re-pointing.

Repairing masonry cracks: Remove loose masonry with a masonry chisel and a wire brush. Use a caulk gun to apply a masonry patch to the crack. Latex masonry fillers are the easiest to apply and clean up. Smooth the patching material with a putty knife, trowel or a wooden dowel.

Replacing mortar: Chisel out the loose mortar with a hammer and chisel. This process is called raking. Clean the joints with a soft brush. Saturate the joints with water about fifteen minutes before applying the new mortar. Mix new mortar using mortar color to make the new mortar slightly darker than existing mortar. When the new mortar dries, it will match the existing mortar. Pack the joints with mortar, using a pointed trowel. Point the vertical joints first. Smooth the mortar with a smoothing tool or wooden dowel. Re-wet the area after twenty-four and forty-eight hours. This will make the mortar stronger.

Replacing a brick: Cracked, flaking or badly damaged bricks should be removed and replaced. New bricks should match existing in color and texture. Drill through a damaged brick using a masonry bit in an electric drill. Chop out the brick with a cold chisel. Use a hammer and chisel to clean out the old mortar joints. Saturate the hole with water and spread a layer of new mortar in the hole. Insert a new brick, scrape off excess mortar, and finish the joints with a wooden dowel.

Repairing cracks in stucco: Using a chisel, open the crack until you reach solid stucco. Undercut the edges of the repair area. Apply new stucco, packing it into the crack. Wet the repaired area for at least three days by spraying with a hose two to three times a day.

Patching Stucco: Chisel out all loose or damaged stucco until you can see the mesh. Clean the area thoroughly. Undercut the edges of the patch. Apply a base coat to the patch and cure for five days before applying the finish coat.

Cleaning stained masonry: Stains on brick or stucco can be cleaned with a solution of one part muriatic acid to nine parts water. Follow the protection and safety instructions on the container. Scrub masonry surfaces with the solution, using a stiff brush. Rinse with a garden hose. This solution will also remove white powdery stains (efflorescence) from brick surfaces.

For More Information...

[Outdoor Home Repairs Made Easy](#) – repairing cracks that run through brick work, repairing moving cracks and cracks around windows and doors.
[Jackie's Home Repair and Maintenance Charts](#) – repairing cracks in stucco.
[The Outside Handyman](#) – replacing bricks, repairing mortar and stucco.
[Everyday Home Repairs](#) – filling cracks in masonry, replacing mortar.
[The Low Maintenance House](#) – controlling cracking.
[The Old-House Journal Compendium](#) – chemically stripping paint from exterior masonry, removing stains from masonry, restoring old brickwork.

Wood Siding and Trim**Inspection**

Check the condition of siding and trim every spring because winter weather can cause serious damage to exteriors. Check wood shingles for tightness of fit. Look for splitting, cracking or rotting boards.

Reattach loose siding. Replace damaged siding with materials of the same width and thickness. Look for rot. Check for spongy or discolored wood and for rust around nail heads, staining the underlying paint. Wood exposed to rot is weak and must be replaced.

Problem Assessment

If your home's siding looks worn, do not assume that a coat of paint will cure the problem. If a siding board or a wooden shingle is splintered or rotting, it must be replaced.

Cracked, split boards should be repaired as noticed to prevent rainwater from leaking into the stud cavity and damaging the wall structure.

When the color of wood shingles begins to fade, a sealer or stain may be applied with a paint brush. Scraping or sanding, in this case, is usually not necessary.

Rotted boards must be replaced to prevent the rot from spreading. Rot is sometimes caused by rising damp. This is a condition where water travels up from the ground and is absorbed by the wood. Leaking gutters and downspouts can also cause rot to occur.

Peeling or blistering paint may be a sign of moisture problems which must be corrected prior to the installation of new siding.

Should You Do It Yourself?

You can complete most repairs to wood siding and trim without too much difficulty. Hardware store and lumber yard employees can give advise on stains, sealers, and replacement siding.

Approval from the City

Repairs to siding and trim do not require approval from the City.

The Housing Code states that all exterior wood must be weather-tight and must be sealed, painted, or pressure treated to prevent rot.

Design Considerations

It is best to preserve the original siding, if possible, because it is an important architectural feature of a house.

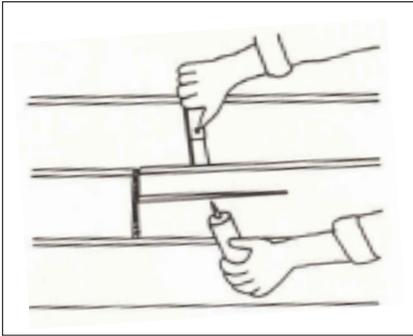
Deteriorated siding sometimes looks worse than it actually is. Split or warped boards can easily be repaired and badly damaged boards can be replaced.

Always make repairs as soon as a problem becomes noticeable. A few rotting clapboards can turn an attractive house into an eyesore.

Tools Needed for Repairs

Chisel, shingle splitter, hammer, nails, wood putty, waterproof glue, wooden wedges, saw (circular saw or back saw), compass saw, epoxy resin cement, plane.

How to Complete the Repairs

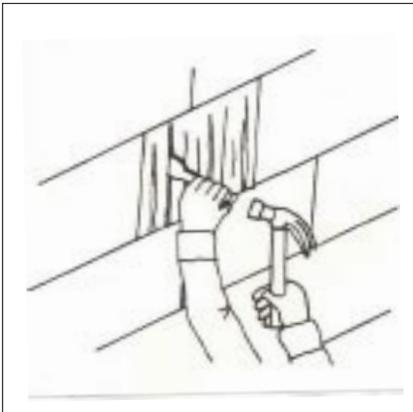


Repairing split siding.

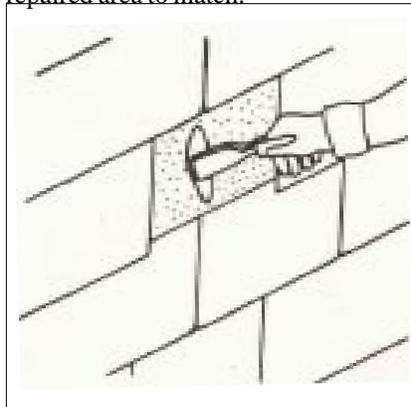
Repairing cracks and splits: Minor cracks and splits can be filled with wood putty. The repaired area should be sanded down and repainted. To repair a crack or split at the end of a board, first remove nails from the lower section of the board at the appropriate end. Lever the bottom section of board away with a chisel. Apply an epoxy resin cement or a waterproof adhesive onto both sides of the split (or well into the crack). Remove the lever and nail the board back so that the gap is closed. Wipe away excess glue. When the glue dries, touch up the repaired area with paint or stain to match.

Repairing warped clapboards: If a board is warped because its fit is too tight, remove the nails from the affected board and plane a little off one end. Then drill pilot holes so that nails do not split the boards when you hammer them in. Fill any holes with wood putty and touch up the finish.

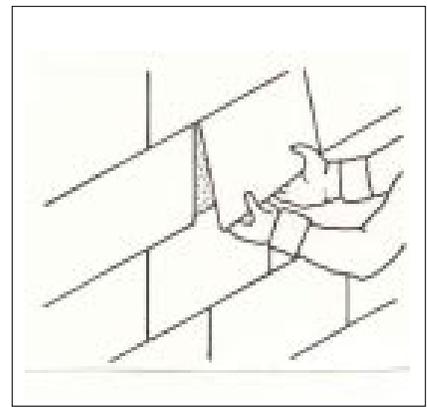
Replacing shingles: Remove damaged shingles by driving a chisel into each shingle, causing it to splinter. Pull out the sections of the shingle as they become loose. Once the damaged shingles are removed, examine the building paper underneath and patch any tears or cuts with asphalt cement. Insert a new matching shingle and secure it with two new nails. Drive nail heads below the surface with a punch and fill the holes with wood putty. Stain or paint the repaired area to match.



Remove shingle.



Patch tears in building paper.



Insert new shingle.

Replacing rotten wood: Make a vertical cut through the board at the end of the damaged section. Remove the nails in the exposed section of wood and use a chisel to cut out the damaged wood. Cut a patch from a matching length of siding. Use a short length of board to knock against as you wedge the patch into position. Drive a few nails through the upper board to secure the patch. Drive nail heads below surface with a punch and fill the holes with wood putty.

For More Information...

The Outdoor Handyman – repairing cracks and splits, replacing shingles and rotted wood.

How to Replace and Install Roofs and Siding – replacing split boards, tongue-and-groove boards, and lapped siding.

Time/Life Books Complete Home Repair Manual – replacing clapboards.

Handbook of Exterior Home Repairs – repairing siding, caulking exterior joints.

The Old-House Journal New Compendium – using epoxies to repair damaged and deteriorated wood.

Preserving and Maintaining the Older Home – repairing large cracks and rotted wood.

Inspection

Check the condition of siding every spring because winter weather often causes damage.

Check the general condition of aluminum or vinyl siding. Check aluminum for dents, scratches, peeling or fading. Also check for chalking. Chalking occurs as the enamel paint on aluminum siding gradually breaks down. Check vinyl siding for punctures and tears.

Check the joints between siding and corner boards, door frames, and window frames. Also check joints between dissimilar materials. Make sure the caulking is resilient and adheres to both sides of each joint.

Problem Assessment

Dirt and pollutants adhere to the pigments used to color siding. The best way to clean siding is with hot water and high-pressure soap.

If caulking has dried up, cracked or fallen out, replace the caulking in order to prevent leakage.

If the siding on your home is more than ten years old and is badly faded, dented, torn or bulging, you may need to replace the siding.

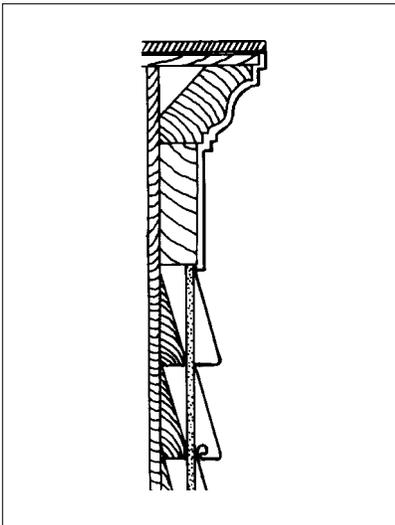
Should You Do It Yourself?

Synthetic siding can be cleaned and repaired without too much difficulty. You may also decide to replace damaged panels yourself, but you should hire a professional to install new siding because correct application is very important. Aesthetic and structural problems can result from incorrect installation.

Approval from the City

When covering or replacing wood siding with aluminum, vinyl or other synthetic material, you must get approval from the Architectural Board of Review.

A building permit is required to install new siding, but not for siding repairs.

Design Considerations

Many homeowners are attracted to synthetic siding because of perceived low maintenance. However, synthetic siding may actually accelerate certain maintenance problems. For example, synthetic siding can trap moisture, and the damp wood under the siding can deteriorate without the damage being detected. Siding can also hide insect damage or cause fastener damage to the top of the underlying clapboards.

If you decide to re-side your home, be sure to preserve any significant architectural details, including trim, cornice moldings, window and door frames, and corner boards. Either fit the new siding around these features or have them replicated in aluminum or vinyl.

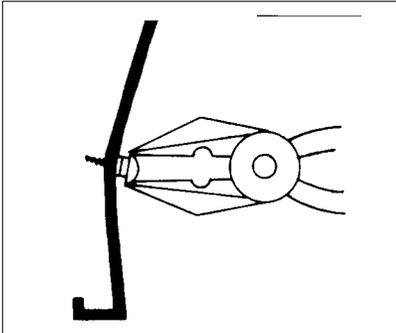
Synthetic siding is available in several different widths. Choose the width that most closely replicates the width of existing clapboards. The siding on your house and garage should be the same in width and color.

Avoid siding that has a “wood grain” pattern because real wood clapboards have a smooth finish.

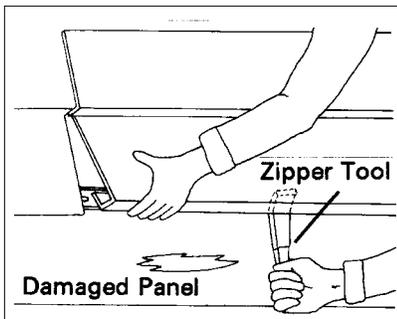
Tools Needed for Repairs

Caulking, solvent, caulk gun, wire brush, screwdriver, self-tapping screws, washers, plastic aluminum, garden hose, detergent, bleach, trisodium phosphate (Spic and Span), nails, hammer, roofing cement, snaplock punch, zipper tool (for replacing vinyl siding), utility knife.

How to Complete the Repairs



Fixing a dent in aluminum siding.



Replacing a vinyl panel.

Recaulking: Remove old, cracked caulking with the blade of a screwdriver. This job is easier in warm weather. Go over the area with a stiff wire brush and wipe with a solvent. Apply new caulking to the crack, moving the caulk gun slowly to ensure that the caulking fills the crack. Use butyl caulking because it stays flexible longer than other caulking materials and it takes paint well.

Removing mildew: Wash the surface using a mixture of three ounces of trisodium phosphate (or Spic and Span), one ounce of powdered detergent, one quart of household bleach, and three quarts of warm water. Scrub the siding with a hard brush and rinse.

Fixing a dent in aluminum siding: Drive a self-tapping screw into the center of the dent, using a couple of washers to keep the head away from the surface. Grip the screw and pull it until the dent pops out. Remove the screw and fill the hole with plastic aluminum. Sand and touch up the repaired area with matching paint.

Replacing an aluminum panel: Use a utility knife to cut a slit along the center of the damaged panel. Unhook and discard the lower portion, leaving the upper half of the panel in place. Cut the nailing and locking strip off the replacement panel. Apply roofing cement along the length of the damaged half panel. Slide the top edge of the new panel under the locking hook of the panel above, while locking it firmly into the lip of the panel below. Press down firmly to cement the panel.

Replacing a vinyl panel: using a special tool called a zipper (available from siding dealers) reach under the panel directly above the damaged panel, in order to hook into the locking strip inside the top of the damaged panel. Pull down firmly while sliding the zipper along the length of the damaged panel. This will unlock the upper panel, which can then be propped up to remove the nails holding the damaged panel. Lock and nail the damaged panel. Then use the zipper to re-lock the upper panel.

For More Information...

[Handbook of Exterior Home Repairs](#) – repairing siding and caulking joints.

[Time/Life Books' Complete Home Repair Manual](#) – replacing damaged aluminum and vinyl panels.

[The Outdoor Handyman](#) – fixing a dent in aluminum siding.

“Here are the Aluminum Siding Facts,” [Plain Dealer](#), April 26, 1984 (Home Improvement Guide, Special Supplement).

“Siding: The Home’s Armor,” [Plain Dealer](#), March 4, 1988 (Home Improvement Guide, Special Supplement). Discusses various kinds of siding, including vinyl-coated aluminum siding.

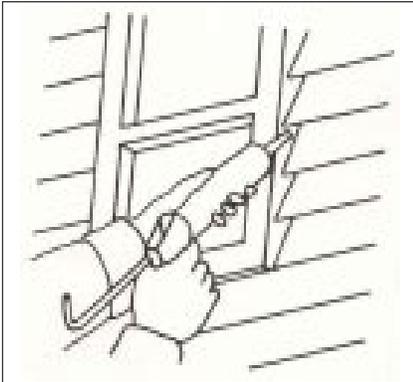
[Home Improvements: 52 Easy Weekend Projects](#) – installing siding.

[The Old-House Journal Compendium](#) – discusses natural versus synthetic siding materials.

“Weatherization and Insulation,” [Hometime Series Video](#) (PBS) – caulking exterior joints.

Windows and Doors**Inspection**

Windows and doors require regular maintenance to withstand rain, snow, and wind. In the spring, check the condition of the screens, as well as the caulking and glazing compound around windows. Also check to see that windows and doors are lined up squarely in their frames.

Problem Assessment

Caulk the intersection between window frames and siding.

Windows and doors may rattle due to the warping, swelling, and shrinking of their frames. Windows and doors may also rattle when a house settles unevenly. A rattling door can easily be fixed using weatherstripping.

There are several reasons why a door may not be lined up squarely in its frame. If the door sticks, it may require planing or its hinges may need tightening. Shimming the hinge (placing a thin piece of wood or cardboard behind the hinge) will solve a latching problem and re-align a door within its frame. Cracked, dry, glazing compound must be removed and replaced. The compound protects against air and moisture penetration. It also cushions the glass in its frame.

If the caulking is not resilient, does not fill a gap completely or does not adhere to both sides of a joint, you should re-caulk. Joints between two different materials, such as between window frames and siding, should be caulked to prevent leakage, mildew, rot, and heat loss.

Small holes and breaks in screens can be repaired with a patch of the same type of screening. Larger tears or bulges will require removing the damaged screen and replacing it.

Should You Do It Yourself?

Window and door repairs can often be made without too much difficulty. A second person may be necessary if you intend to remove a door from its hinges.

Approval from the City

The replacement of a window or door requires approval from the Architectural Board of Review.

Design Considerations

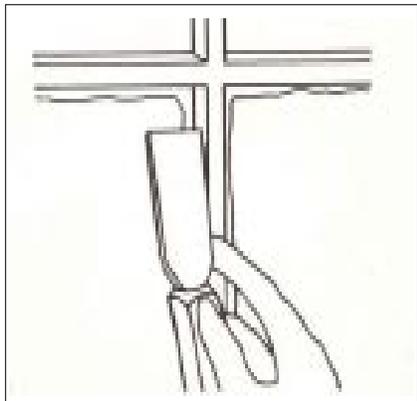
Windows: It is usually best to preserve the original windows in an old house, unless they are extremely deteriorated. If windows must be replaced, the new windows should replicate the style, proportions, and glazing pattern of the existing windows. Changing the proportions and styles of the windows can drastically alter the appearance of a house, often for the worse. Custom-made windows can be ordered, if necessary, which replicate a home's original windows.

Doors: Front doors sometimes have an interesting design which contributes to a house's special, individual character. If your home's original door is missing or is too deteriorated to save, try to find a new or used door that will match the style of the house. Avoid closing up part of a wide or tall entrance to make it smaller because this affects the proportions of a house.

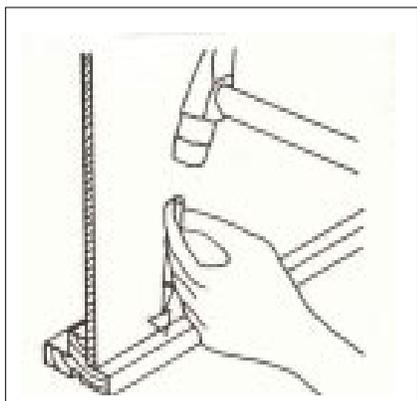
Tools Needed for Repairs

Hammer, finish nails, pliers, screwdrivers, screening material, putty knife, staple gun, powdered graphite, silicone spray, glazing compound, glazier's points, replacement glass, wood preservative, nail set, weatherstripping, wood plane, wood screws, wood glue.

How to Complete the Repairs



Remove old glazing compound and caulking with a putty knife.



Install glazier's points to secure the glass in the frame and re-putty.

For More Information...

Repairing a rattling window: First determine whether the rattle is due to a loose sash within a frame or a loose pane of glass. As a temporary measure, wedge the sash into its frame, using wood or rubber wedges, and secure the pane in place with glazier's points. Rattling panes are usually caused by loose glazing compound. To repair, remove the pane and the loose putty. Then re-putty from the outside of the house.

Repairing a rattling door: Doors begin to rattle because weatherstripping compacts and deteriorates over time. When this happens, replace the weatherstripping. The strike plate in the door may also need adjusting. If the door is sagging and sticking, check the hinges. The screw holes in the jamb may have become enlarged, so the screws will not tighten. If this is the case, fill the holes with wooden plugs and replace the screws.

Caulking: A good seal is especially critical at the joints between the siding and the windows and doors. The top of a window or door is most susceptible to leakage problems.

Replacing glazing compound: All cracked, dry compound should be removed with a putty knife. Then remove the glass. Make sure that all of the compound is removed. Roll new glazing compound into "snakes" and run them along the sash. Replace the glass, pressing it into the compound. Install glazier's points, using a nail set to secure the points. Press more "snakes" of compound into position. Use a putty knife to smooth. Remove any excess compound.

Maintaining screens and frames: All hardware used with screens should be rust-resistant. Wood frames should be painted regularly. Screens should be cleaned each fall.

Patching screens: Cut a piece of patching material from the same type of screen as the area to be patched. Remove the wires on the patch, which are parallel to each side of the patch, to a depth of ½ inch. Slip the wires of the patch through the screen and wave them into the sound portion of the screen.

[Complete Book of Home Repairs and Maintenance](#) - fixing screens, latches, deadbolts, and rattling doors and windows.

[Jackie's Home Repair and Maintenance Charts](#) – fixing loose and squeaky hinges, balancing hinges, adjusting and extending the strike plate, replacing and patching screens.

[Time/Life Books Complete Home Repair manual](#) – fitting doors.

[Handbook of Exterior Home Repairs: A Practical Illustrated Guide](#) – caulking windows and doors.

[Home Repairs: 52 Easy Weekend Projects and Home Improvement: 52 Easy Weekend Projects](#) – weatherstripping, repairing and replacing windows and doors, repairing screens and rattling windows.

"Common Home Repairs," Hometime Series Video (PBS). (Available in the Building Department) – repairing windows and doors.

[The Old House Journal Compendium](#) – restoring windows, rotted window sills and window sash, sealing leaky windows.

Painted Surfaces***Inspection***

Check painted surfaces every spring for blistering, peeling, curling or fading. Paint the exterior of your home every three to five years to protect it from sun, weather, and other environmental factors which can gradually cause damage.

Problem Assessment

Whenever you see stains or layers of paint pulling away from the surface, try to identify the cause of the problem and fix it. These problems are usually caused by moisture penetration.

Faulty construction can also cause paint failure, when moisture becomes trapped in outside walls. Other causes of paint failure include incomplete surface preparation and the use of incompatible paint. If you ignore these problems or repeat the same mistakes with a new paint job, blistering and curling will recur.

Small areas of paint failure can be patched, but if large areas of paint have deteriorated, you should completely repaint your home.

Most paints are designed to chalk so that a clean surface is continually exposed. Chalking paint cannot be prevented and does not need to be repaired.

Should You Do It Yourself?

If you have painting experience or have researched paint preparation and application techniques, you might consider painting your own home. Ask a paint dealer or a knowledgeable neighbor for tips and suggestions. If you do not have the time or the inclination to paint your own home, there are many professional painters who will do the job for you.

Approval from the City

No permits or approvals are needed from the City to paint a house. A permit is needed for abrasive cleaning or blaststripping to remove paint from a house. A permit is also necessary if more than 25% of the paint on any wall is removed by a heat gun, power sanding or scraping.

Owners of Landmark homes should inform the Landmark Commission when they wish to repaint. The Commission will advise homeowners on appropriate color schemes, based on the architectural styles of their homes.

Design Considerations

Before repainting your home, consult *Shaker Village Colors*, a reference guide designed to help you select colors that are appropriate to the style of your home. This booklet is available free from the Planning Department.

You should also look at the colors of other homes in your neighborhood. Choose colors that are compatible with your neighbors' paint schemes. Paint colors should also be compatible with the colors on your home which are not subject to change – including the color of the roof and that of any brick or stone.

The decision to paint your home is more than an issue of aesthetics. Paint is a protective covering for wood and metal and if you don't paint regularly, you may be exposing your home to deterioration and future maintenance problems.

Tools needed for Repairs

Extension ladder, scraper, wire brush, sandpaper, exterior paint, turpentine, brushes, paint stirrer, primer, metal paint for non-bonded gutters and downspouts, garden hose, mild detergent.

Painting Tips

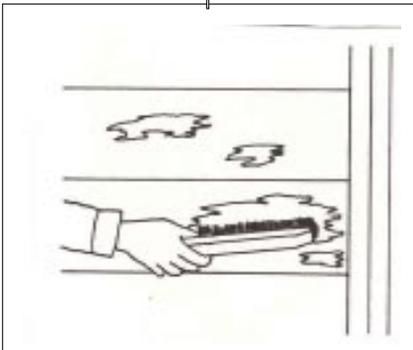
Follow the directions on the paint product. Short cuts and changes can result in paint failure. Expect to use one gallon of paint per every four hundred square feet of surface area for smooth surfaces; one gallon of paint per two hundred and fifty square feet for rough surfaces. Allow one gallon of trim paint for every five gallons of body paint.

Paint your home every three to five years. Plan to repaint at a warm, dry time of year. The temperature should be at least forty degrees Fahrenheit.

Use latex or alkyd-oil paints. Latex paints hold up better and are more resistant to cracking and peeling. However, if you are repainting over many layers of oil-based paint, use an alkyd-oil paint.

Remove old paint by scraping—not by using flames or chemicals, or by sandblasting. These techniques can seriously damage the underlying wood.

Correcting Paint Problems



Remove peeling, curling or loose paint.

The key to a long lasting paint job is the proper preparation of the surface.

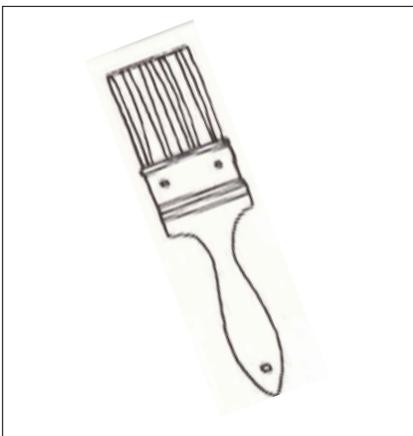
Blistering paint: Paint blisters when it is applied to a moist surface or when it is applied in direct sunlight. Correct any moisture problems prior to repainting. When the siding is dry, scrape off blistered paint, sand, and repaint. Make sure the surface is not too hot while painting or while the paint is drying.

Peeling and curling paint: Paint peels and curls when it is applied over dirt, grease or loose paint. Paint also peels if it is applied to a moist surface. Scrape off all peeling, curling, or loose paint. Let the wood dry and then repaint.

Faded paint: Paint fades and becomes discolored if it is applied to a dirty surface or if there is any dirt in the paint when it is applied. Corrosion of copper and bronze screens and fittings and mildew also lead to discolored paint. Repaint faded or discolored surfaces. Make sure surfaces and brushes are clean and dry and paint is free of dirt.

Painting masonry: To help prevent paint on masonry from peeling, first apply a masonry sealer. Then paint with an alkali-resistant coating.

For More Information...



“Exterior Painting,” [Hometime Series Video](#) (PBS) – painting the exterior of your home.

“Home Improvements,” [Plain Dealer](#), April 28, 1987, special supplement – selecting a house paint.

“Home Improvement Guide,” [Plain Dealer](#), April 28, 1983, special supplement – choosing colors, types of paint, and application methods; preparing surfaces; applying paint.

“Mechanical Stripping of Exterior Paint: Information and Guidelines,” Pamphlet available in the Shaker Heights Building Department.

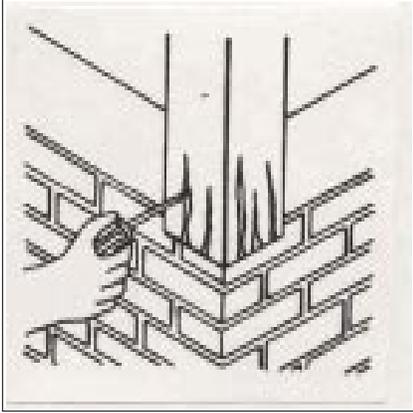
[Your Home](#), Newsletter of the Housing Resource Center – power washing a house before painting.

[Outdoor Home Repairs Made Easy](#) – preparing exterior surfaces for paint.

[Jackie’s Home Repair and Maintenance Charts](#) – diagnosing paint problems.

[Time-Life Books Complete Home Repair Manual](#) – diagnosing paint problems.

[The Old-House Journal Compendium](#) – avoiding mistakes in exterior painting.

Inspection

Rotted wood will crumble easily when probed with an icepick or a screwdriver.

Exposure to weather can damage decks, porches, porticos, and canopies. These elements are vulnerable to dampness, rot, and insect infestation.

Moisture fosters the growth of wood rotting fungi and bacteria. Moisture may become trapped in joints and between floor boards, and can be absorbed through the end grain of cut boards. Moisture may also collect around the bottom of porch and deck posts and can be absorbed directly from the earth wherever wood meets the ground. Wood boring insects are also destructive, because they can gnaw through critical support members.

Inspect porches, porticos, decks and canopies periodically. If you catch damage in its early stages, you may avoid the need for extensive repairs. Spongy or discolored wood is an indication of rot. Piles of wood fibers or insect wings that have been shed are signs of insect activity. Exterminate insects before beginning any repair work.

If a porch, portico, deck, or canopy is painted, scrape and repaint blistered and cracked sections as necessary. Once a year, apply a wood preservative to any lumber that is not painted or pressure-treated. Keep the floor of a wood porch or deck swept clean of leaves because leaves retain moisture. Repair roof leaks promptly.

Problem Assessment

If rot and insect damage is extensive and widespread, it may be necessary to replace the entire porch, portico, deck or canopy. Often however, you can repair a structure by removing and replacing damaged sections.

Individual floor boards can be replaced. Be sure to check the underside of the flooring for signs of decay and moisture. Check the joists for rot. Weakened joists must be reinforced.

To guard against future damage, always replace porches, porticos, decks, and canopies with pressure-treated lumber and use galvanized nails and anchors in order to prevent rust.

Uneven settling of a foundation may cause a porch or deck to sag. When both the porch roof and floor sag in the same area, the cause of the problem may be in the foundation or footings.

Should You Do It Yourself?

Small repairs to decks, porches, and canopies can often be made without too much difficulty.

Attempt major repairs only if you have carpentry experience. You will need a helper when using a jack to lift a porch roof.

If a porch or deck is sagging, call a professional for advice.

Approval from the City

A permit is required from the Building Department if you plan to build a new porch, portico, deck or canopy, or to enclose a porch. You will first need to have the project approved by the Architectural Board of Review.

Tools Needed for Repairs

Check with the Planning Department to see if your plans comply with the Zoning Code, which requires a minimum distance, or setback, between a structure and your property lines. The Zoning Code also regulates the types of structures which may be built.

House jack, replacement lumber, hammer, galvanized nails, wood putty, sandpaper, claw hammer or crow bar, circular saw, saber saw.

Design Considerations

Retain as much of the original building fabric as possible. When it is necessary to replace porch supports and railings, try to replicate the original elements as closely as possible.

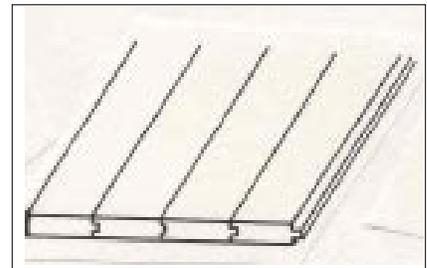
Never replace wood columns, railings or balusters with thin wrought iron members. These elements look weak and out of place.

Decks should be designed with the architectural style of the house in mind.

How to Complete the Repair

Replacing columns and posts: If a support must be replaced, find a replacement member that is identical to the existing supports. Before replacing a column or post, support the roof with a jack. This will make it easier to pull out the old support. Replace supports one at a time. When the old support is removed, clean the flooring and underside of the roof. Nail the new support in place.

Replacing damaged floor and ceiling boards: If your porch has square-edged floorboards, you can pry a defective board from its joists using a claw hammer or crow bar. Replace the board with another of the same dimensions. The new board must be nailed to each of the joists it crosses and at each end. Stain or paint to match. If your porch has tongue-and-groove floor boards, defective boards must be cut out with a power saw and replaced.



For More Information...

Time-Life Books Complete Home Repair Manual – repairing posts and hollow columns, patching a tongue-and-groove floor, reinforcing a damaged joist, replacing part of a post.

Outdoor Home Repairs Made Easy – replacing floorboards, fixing steps, leveling porch roofs, replacing pillars.

“Get Extra Space at Low Cost by Adding a Deck,” The Plain Dealer, special supplement, April 25, 1985.

The Low Maintenance House – maintaining a deck.

“Porches,” Home Again Series (video) with Jim LaRue (Housing Resource Center) – repairing rotting floor joists and fascia boards.

The Home Repair Book – repairing porch steps.

Inspection

Maintenance and repair of the public sidewalks on your property are your responsibility. Preventive maintenance is essential for public sidewalks. Inspect sidewalks twice a year. Moisture and temperature changes cause sidewalks to crack and buckle, resulting first in small cracks and holes, and later in more serious cracking and spalling. Repair damage as it appears. This will extend the sidewalk's life and keep the condition from getting dangerous.

Keep pavement well sealed because water penetration and salt can seriously damage concrete. Use a clear masonry sealer once a year for maximum protection against staining, spalling, and water damage. Also, repair soil erosion around the slab to prevent water seepage.

Tree roots can also damage concrete, but **do not** attempt to cut a tree root without first contacting the Shaker Heights Public Works Department.

Problem Assessment

Hairline cracks, soft concrete, chalky surfaces, and dusting are signs of poor concrete installation.

Should You Do It Yourself?

Small repairs to public sidewalks and driveway aprons can usually be made without too much difficulty.

Hire a contractor to replace large sections of public sidewalks and driveway aprons. Do not attempt to replace cement sidewalks unless you have experience. Practice on several smaller projects, such as a square of concrete under a downspout, before tackling a sidewalk. Sandstone replacement or re-leveling should be done by a qualified contractor, due to the weight of the stone.

Approval from the City

The Housing Inspection Department makes inspections every three years or at a point of sale. The Department will notify you if a sidewalk or driveway apron needs repair. If sidewalks are more than one inch out of grade or if there are cracks wider than one inch, you will be asked to make repairs. You may hire a contractor through the City who will make the repairs, but you will be charged a fee for any work done.

A building permit is required to replace sidewalks and driveway aprons. Driveway aprons must be concrete, constructed in accordance with the "Department of Public Service Specifications for: Concrete Sidewalk/Apron Repairs."

Design Considerations

Sidewalks slope slightly toward the street so that rainwater will drain. Concrete should be poured over a six-inch gravel fill when drainage is poor. Sidewalks must be a minimum of four inches thick. Driveway aprons and sidewalks adjacent to an apron must be a minimum of six inches thick.

Sidewalks and driveway aprons should be constructed as far as possible from large trees because tree roots may cause sidewalk displacement. house and garage should be the same in width and color.

Tools Needed for Repairs

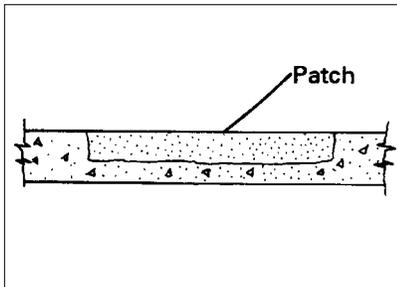
Masonry chisel, ball peen hammer, concrete patching compound, pail, trowel, pointing trowel, putty knife, sledgehammer, shovel, hoe, two-by-fours, wood float, edger or groover, concrete (dry mix), cement mixer (for large jobs).

How to Complete the Repairs

General considerations: Repair concrete when winds are light and when the temperature is 50°F to 80°F. If the concrete dries too fast or freezes when wet, it will not set properly. Concrete should be poured no later than one half hour after it has been mixed. Allow concrete to cure for a week to ten days by covering with burlap or wet straw. Do not allow concrete to dry too quickly.

Patching small cracks and holes: Small cracks and holes can be repaired with ready-mix concrete patching material which can be applied with a caulk gun. To fill small cracks, use a ball peen hammer and a chisel to undercut the crack. Create an inverted triangle to hold the patching material in place. Use a shop vacuum or a stiff brush to clean the crack. Use a trowel to spread the patching material in and evenly over the crack. Smooth the surface with a trowel and allow the patch to cure according to the manufacturers' instructions.

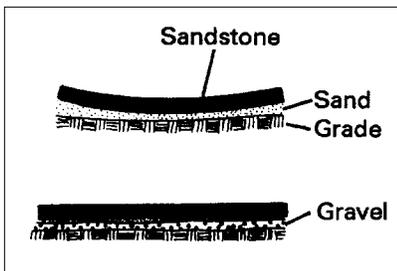
To patch small holes, use a ball peen hammer and a chisel to undercut the edges of any holes. Use a putty knife to fill the hole with patching material and apply pressure to smooth the patch outward. Let the patch stiffen for one or two hours before troweling if mortar mix is used; otherwise follow the material's instructions. Trowel the surface and allow the patch to cure over the next few days. Protect patch from direct sunlight or foot traffic while curing.



A proper patch has vertical sides and is flush with the surface of the sidewalk.

Patching large cracks and holes: A concrete patching mixture of one part Portland cement to three parts sand is best for mending large cracks. To treat large cracks, chip away cracked and crumbling concrete with a hammer and chisel to one inch below the surface. Undercut the edges of the crack. Remove all rubble and dirt. Soak the crack with water for several hours. Coat the edges with a mixture of Portland cement and water which has the consistency of thick paint. Pack the mortar firmly into the crack with a pointed mason's trowel. Level the mortar with a square trowel. When the patch hardens, sprinkle it with water and cover it with plastic. Let the patch cure for three to seven days, checking every day to insure that the patch is damp.

Replacing heaved sections: First, break up the heaved concrete slab with a sledgehammer. If a tree root caused the sidewalk to heave, check with the Public Works Department to see if the root can be removed. If it can, cut the root out with an axe. Replace that section of the sidewalk with a thick gravel base to absorb growth expansion. If frost caused the sidewalk to heave, install wire reinforcing mesh before pouring concrete over the new section.



Gravel screening used to level a sandstone walk.

Repairing sandstone sidewalks: Cracked sandstone sidewalks cannot be repaired. If a sandstone walk is broken into pieces or is out of level more than one inch, the sandstone must be replaced, either with new sandstone or with concrete. A sandstone sidewalk that is not level with adjacent walks can be re-leveled by placing gravel screenings in the low area under the slab. Do not attempt to re-level a cracked sandstone slab, as this will worsen the cracking.

For More Information...

[Home Improvements: 52 Easy Weekend Projects](#) – replacing a sidewalk.

[Home Repairs: 52 Easy Weekend Projects](#) – patching cracks and holes in sidewalks, sidewalk maintenance.

[Everyday Home Repairs](#) – cleaning, sealing, and patching concrete.

[Jackie's Home Repair and Maintenance Charts](#) – mixing concrete.

[Outdoor Home Repairs Made Easy](#) – repairing concrete, filling cracks.

“Patios and Walkways,” [Hometime Series](#) video - laying sidewalks.

Inspection

Asphalt driveways need regular maintenance to prevent water from seeping under the asphalt and causing damage to the gravel or stone bed. To protect asphalt from most forms of deterioration, coat it once every four or five years with a waterproof, chemical-resistant sealer. Inspect brick and flagstone patios once a year. Check for settling and heaving of bricks or flagstones.

See Repair Sheet J – “Public Sidewalks and Driveway Aprons” – regarding the maintenance and repair of concrete walks, driveways, and patios.

Problem Assessment

Asphalt can develop cracks and holes from frost and ice. It can also be damaged by oil and salt.

A driveway should be resealed when small cracks and fissures appear, to prevent potholes from developing. Sealer fills hairline cracks and protects the asphalt against water damage.

Driveways or walks that are severely cracked, buckled or deteriorated must be replaced. When patios and walkways have heaved or settled badly, they also must be replaced.

Should You Do It Yourself?

Patching cracks and holes in an asphalt driveway and sealing a driveway are fairly simple projects. Small repairs to walkways and patios can also be made without too much difficulty. If a private walk must be replaced, you will find that flagstone, brick, and stepping stone walks are the easiest to build.

Replacing a driveway is a complex project, so you should consider hiring a contractor.

Approval from the City

A building permit is required for driveway paving, resurfacing, and replacement. A permit is also required for the construction of new walkways and patios.

Approval from the Board of Zoning Appeals is required to install or extend driveways, turn-arounds, parking pads or other paved areas.

You may use brick pavers for driveways, but they may not cross the public right-of-way. Usually, the right-of-way extends from the inner edge of the public sidewalk to the street. Driveway aprons must be concrete, constructed in accordance with the “Department of Public Service Specifications for: Concrete Sidewalk/Apron Repairs.”

Design Considerations

Brick and flagstone walks can be an attractive addition to a home or garden if they are well designed.

Brick patios are often more attractive than concrete slabs. Concrete patios, however, can be enhanced by spreading small stones into the surface of the concrete or by using different scoring patterns in the surface.

The design and layout of patios and walkways should reflect the architectural style of the house and the natural features of the property.

Tools Needed for Repairs

Asphalt driveway repairs: Garden hose, vacuum or brush, asphalt cleaner, trowel, caulk gun, asphalt patcher (cold-mix patcher), putty knife, screwdriver or chisel, squeegee/broom, asphalt sealer, shovel, tamper, heat gun.

Patio and walkway repairs: Bricks, flagstones, stepping stones, mortar, sand, two-by-fours for forms, shovel, broom, trowel, rubber mallet.

How to Complete the Repairs



Sealing asphalt.

Filling cracks in asphalt: Clean weeds and dirt from the crack with an old screwdriver. Brush any remaining material from the crack. Patch the crack using a caulk gun and a tube of asphalt patcher. Spread and smooth the patch material using a putty knife. For large cracks, buy a can of asphalt crack filler. Use a trowel to scoop out filler and to force it deep into the crack.

Repairing holes in asphalt: Clean loose dirt and asphalt out of the hole. Use a brush or a vacuum to remove smaller material. Measure the depth of the hole. Any holes over two inches deep should be filled with jagged stone until the depth of the hole is only two inches. Tamp lightly. Trowel asphalt topping into the hole. One bag of asphalt topping covers a three-foot square area, two inches deep. Choose a hot day to apply. Tamp the asphalt so that it is firmly packed into the hole.

Replacing settled or heaved bricks in a patio or walkway: Pry up the bricks. Add sand. Water the sand to compact it. Reinstall the bricks. Spread sand over the surface and sweep into the joints.

For More Information...

“Asphalt Driveway Repairs,” Height Community Congress (Video) – repairing holes, filling cracks, sealing asphalt.

Patios and Walkways,” [Hometime Series](#) (Video) – laying new patios, walkways and curved sidewalks.

[Time-Life Books Complete Home Repair Manual](#) – patching damaged asphalt, replacing an asphalt driveway, patching concrete driveways and walkways.

[Everyday Home Repairs](#) – patching holes in asphalt, sealing asphalt driveways.

[Jackie’s Home Repair and Maintenance Charts](#) – building flagstone and stepping stone walks.

[The Home Repair Book](#) - repairing concrete, brick, flagstone patios.

[Outdoor Home Repairs Made Easy](#) – replacing flagstones, repairing stonework, repairing concrete.

“Brick Walks” in [The Old-House Journal New Compendium](#) – designing and laying brick walks.

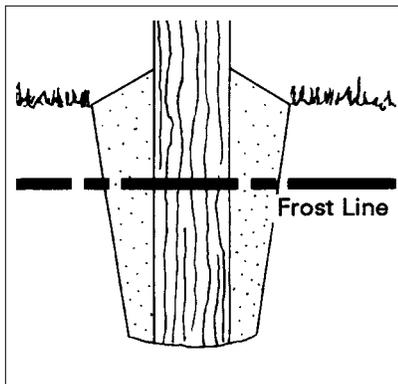
Inspection

Wooden fence pickets and posts should be inspected periodically for deterioration and rot. Horizontal rails are also susceptible to rot because water often collects on top of the rails. Given time and lack of maintenance, rot will result.

Fence pickets may become loose as the changing weather swells and shrinks the wood around the nail holes.

Inspect metal fences every spring for signs of rust.

Fence repairs include cosmetic maintenance. Repaint or re-stain wood fences as necessary. Apply a rust-resistant paint to metal fences every few years.

Problem Assessment

Fence posts should be buried below the frost line (36" below ground).

The gate post is likely to be the first area which needs to be repaired because the swing of the gate may pull the gate post loose in its hole.

Loose posts are caused by the shifting or settling of a fence. Also, fence posts will heave from frost action if the post footing is not buried sufficiently below the frost line.

The weakest part of a fence post is the point where it emerges from the ground because water runs down the post, collects around its base, and seeps between the post and the concrete foundation. Eventually, this will cause a wooden post to rot and a metal post to rust.

Rotten wood members must be replaced, especially if the rot is extensive. Use the old pieces as forms for shaping the replacement members.

If the gate sags, binds or will not latch, check the hinge post to see if it is still solid and perfectly vertical. Also check to see if the hinges are loose.

Should You Do It Yourself?

Basic repairs to fences and gates can be made without too much difficulty. Constructing a wooden fence is also a manageable project, if you're willing to invest time in planning the design, size, and location of the fence. Call a professional if you plan to build an iron fence.

Approval from the City

A fence permit is required from the Building Department before constructing a fence.

Fences must conform to the Zoning Code. The maximum height for decorative fences in the front yard is three feet. A fence can be no closer to the front property line than one-third of the distance from the house to the sidewalk. An interior side yard fence may be up to six feet in height, but there must be at least ten feet between the house and the side property line on both your property and your neighbor's property. A side yard fence may not protrude in front of the front face of your house. Rear yard fences may be up to six feet high. Landscape screening is required for all fences that are located in the front yard or visible from the street; the amount of landscaping required is proportional to the openness of the fence. In addition, fences on corner lots may not extend in front the principal adjacent building .

Variances from these requirements may be applied for to the Board of Zoning Appeals. For more information, call the Planning Department.

Design Considerations

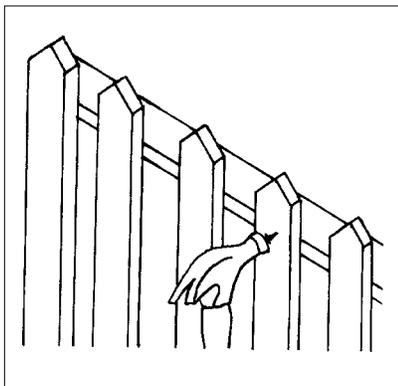
The design of the fence should be compatible with the architectural style of the house. The materials for the fence should also be selected with the style of the house in mind. A simple fence can be enhanced by special treatment of a post or gate.

A fence is an integral part of your yard and should relate to your landscaping plans. Have an overall plan for your yard even if you do not intend to accomplish it all at once.

Tools Needed for Repairs

Hammer, nails, screwdriver, replacement parts, saws, concrete, post hole digger, wooden wedges, wood preservative, waterproof glue, paint brushes, exterior paint, rust resistant paint, sandpaper, metal handle scraper.

How to Complete the Repairs



Nail pickets to fence rails.

Repairing loose posts: Temporarily strengthen a loose post by driving wooden wedges into the hole around the base. Treat the wedges with a preservative and wrap them to the post with baling wire. If the post was set in concrete and has heaved because of frost action, remove it from the ground so that the bottom of the post is well below the frost line. Pour and pack concrete around the post. Attach temporary supports until the concrete has fully cured.

Replacing a rail section: Remove any vertical members attached to the deteriorated rail. Saw off the rail at each of the posts. Cut a new section of rail using the old rail as a guide. Install the rail between the posts. Seal the joint between the rail and posts with caulking. Coat the new rail with a wood preservative.

Re-securing pickets: Pickets and other vertical fence members may be secured by re-nailing them to the rails.

Repairing a gate: If the hinges are loose, reposition them so that the screws are in solid wood. A sagging gate may be stabilized by adding diagonal support members.

Removing rust from metal fences: Remove loose paint from any blistering or rusty surfaces using a metal scraper. Sand all rusted areas to remove scales and rust. Prime the surface and apply several coats of rust preventive paint.

For More Information...

[Shaker Heights Fences](#) – Fence Styles and regulations - available free of charge in the Planning and Building Departments.

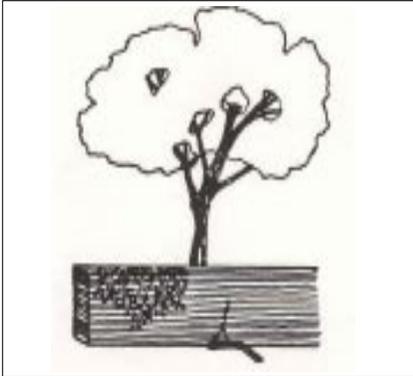
[Outdoor Home Repairs Made Easy](#) – repairing and setting fence posts, repairing and replacing fence rails, repairing gates.

[Home Repairs: 52 Easy Weekend Projects](#) – repairing picket fences and gates, replacing fence posts, painting a fence.

[The Old-House Journal Compendium](#) – repairing and caring for ornamental iron.

[The Old-House Journal New Compendium](#) – designing wood and wrought iron fences.

“Simple Repairs Can Keep an Iron Railing Looking New,” [Plain Dealer](#), special supplement.

Freestanding Masonry Walls**Inspection**

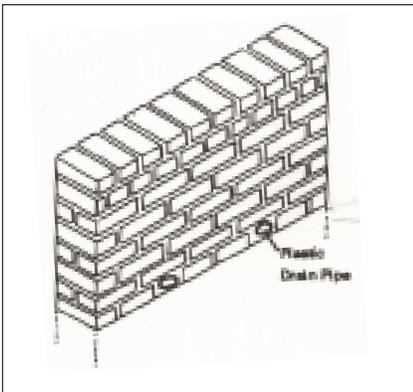
Vines and tree roots can damage masonry walls.

Stone and brick walls are weather-resistant and easy to care for, but regular maintenance is necessary to keep them in good condition. They should be inspected every spring.

A visual inspection is the best way to pinpoint potential problems. Check the mortar in masonry walls for cracks and crumbling. Examine bricks and stones for chipping, cracking, and disintegration. Determine whether any walls have bulged.

Check for damage to walls from vegetation. For example, roots can grow under a wall, causing it to crack or bulge. Vines growing on a brick wall can grip into the mortar and accelerate the deterioration of the wall.

Inspect the condition of dry stone walls every year because, over time, walls will erode and start to separate.

Problem Assessment

Drains through a freestanding masonry wall prevent water build-up.

Before attempting to repair a crack in a free-standing wall, try to determine what caused the crack. Possible causes include: settlement, excessive amounts of water collecting along the wall, tree roots too close to the wall, and expansion and contraction of the masonry units in the wall.

Whatever the cause, the crack will become worse if it is not fixed as soon as it appears. Always try to eliminate the cause of a crack before repairing the wall. For example, if you have a problem with water build-up, install drainage prior to repairing the wall to prevent the problem from recurring.

If a retaining wall is leaning or falling over, it must be rebuilt. A wall may lean if it is not thick enough or if its footings are inadequate. Also, drains built through a wall are necessary to prevent water build-up. If water builds up behind a wall, it will begin to lean.

A dry stone wall (a stone wall in which no mortar or concrete is used) will quickly deteriorate if it is not well-designed. Even if the all is well-designed, the stones can erode and separate after a number of years. Water build-up can also damage a stone wall.

Should You Do It Yourself?

Small cracks in brick and stone walls are relatively easy to repair.

If you would like to build a wall, begin with a low retaining or dividing wall. Once you have mastered the skills of laying brick or stone and have the ability to build a wall that is straight and vertical, you will be ready to move on to larger, more complex projects. Higher walls, however, require foundations and their construction is best left to professional masons.

A large crack or bulge in a wall may be the result of a serious structural flaw. Consult a structural engineer or a contractor for advice.

Approval from the City

No permit is needed to repair exterior walls. A permit is required for new freestanding walls and for replacement walls. New walls may need approval from the Architectural Board of Review. Freestanding walls are treated as fences. See Repair Sheet L for Zoning Code requirements.

Design Considerations

The type of brick, stone, stucco, and mortar used for a wall should reflect the style and material of your home. Walls in Shaker Heights are often built as an extension of the façade, to screen one's line of sight or to enclose an auto court.

Fieldstone walls provide a rustic look that is appropriate for colonial homes. When working with stone, be sure of your design from the start. The finished wall should appear natural, as you would see the stones on the ground. Any stone enclosure should relate to the house in terms of the type of stone, the manner in which it is laid, and the scale of the wall.

The best source of replacement stone is the original quarry. Try to match the color, size, and finish of the original stone. If a wall is brick, replacement bricks and mortar should match the existing wall.

Tools Needed for Repairs

Sledgehammer, hammer, chisel, trowel, pointing trowel, brick, stone, mortar, level, carpenter's square, two-by-fours, bristle brush.

How to Complete the Repairs

Repairing small cracks in stone: Small cracks in stone can be repaired with one of the various epoxy adhesive products made for concrete repair. The epoxy can be tinted to match the stone using masonry color. Clean the surface with a bristle brush and follow the manufacturer's directions for the epoxy product.

Repairing damaged stone: To rebuild the damaged part of a stone, chisel out the deteriorated portion. Fill the hole with a mixture of one part sand, two parts cement, and a little lime. Match the surface and the color of the stone.



Building a dry stone wall.

Replacing a wall: If a retaining wall is falling over, tear it down. Carefully salvage as much of the original material as possible. Try to determine what caused the problem before you rebuild. First, correct any build-up of water behind the wall. Dig a small trench behind the wall and lay some drain tile on a bed of crushed stone to provide drainage. Pour a new footing that is at least twice as wide as the wall to be built on it. If there is a lot of pressure on the wall, you may want to use reinforced concrete for the footing.

Building a dry stone wall: A wall less than three feet high can be built right on the ground without any reinforcement, provided that it is at least three feet wide at the base and tapers to at least one foot wide at the top. A wall that is narrower than this will be unstable. Dig a six-inch deep trench where you want the wall to be located. Fill the trench with five inches of sand. As you lay the stones, tilt them slightly toward the center of the wall, instead of laying them flat. Inset each course as you lay it so that the wall will taper upward.

Repair Sheet D: Masonry Walls – filling masonry cracks, repairing brickwork, replacing mortar.

Repair Sheet L: Fences – code requirements and necessary approvals.

Fences, Walls, and Hedges for Privacy and Security – planning, designing, and constructing fences and retaining walls.

Advanced Masonry – building a brick wall, filling in a damaged wall.

Popular Mechanics Home How-To – repairing and replacing masonry walls.

Masonry – building masonry walls, patching large cracks, replacing bricks.

Masonry Projects and Techniques – laying flagstone and dry walls, repairing masonry walls.

Preserving and Maintaining the Older Home – repairing masonry walls.

For More Information...

Exterior Stairs

Inspection

Exterior stairs should be inspected once a year as they receive constant wear from pedestrians and the weather.

Check to see if wood treads or risers are worn, warped, sagging or broken. Apply a wood preservative regularly to protect against moisture damage. Moisture can get into the joints between pieces and eventually cause rot. Rot is more likely if the steps or their supports are in contact with the soil. Even pressure treated wood is subject to moisture damage, so apply a preservative to this material every two years.

Check brick stairs for cracked mortar joints. These should be re-pointed immediately in order to prevent water penetration which will crack the mortar further. Inspect concrete steps for cracks and spalling. Corners of steps can break off and the edges of concrete steps can chip away. Stone steps also deteriorate, especially at the corners and edges. Repair damaged steps as soon as possible to prevent further deterioration and to ensure the safety of the users.

Problem Assessment

Poor drainage is often the source of problems. Rain accumulation can rot wooden stairs, especially if worn treads have concave areas where water can pool. Paint or stain and caulk are necessary to provide a watertight seal.

Brick stairs often settle as the ground shifts, causing cracks and structural damage. See Repair Sheet D for information on re-pointing mortar joints and repairing damaged bricks.

Large cracks in concrete stairs are usually caused by uneven settlement.

Frost can damage stone stairs. Also, the expansion of metal reinforcing members can damage stone stairs when the pressure from the expansion causes layers of stones to break away.

Should You Do It Yourself?

Basic repairs to wood, brick, concrete, and stone steps can often be made without much difficulty.

With some practice, you may be able to repair limestone or marble steps. If you are inexperienced with masonry work, have an expert make the repairs.

Settled bricks can be corrected by injecting concrete beneath the existing structure. Additional bracing may also be needed. This usually requires professional assistance.

Large cracks in concrete stairs should be examined by a professional engineer or contractor.

Approvals from the City

No permit is necessary to do maintenance work on exterior steps. Approval from the Architectural Board of Review and a building permit are necessary for the complete replacement of exterior stairs or for the construction of new stairs.

Design Considerations

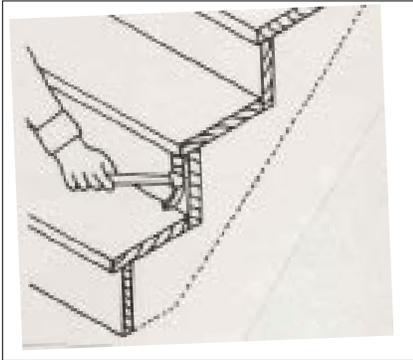
Although concrete is a durable and long-lasting material, concrete steps may be inappropriate to the architectural style of your house.

Think of an exterior stair as an extension of your home, rather than as a separate, replaceable component. If you must rebuild a staircase, use the same design, materials, and railing as the original stair. Retain stone steps, if you have them, because they are an important architectural feature.

Tools Needed for Repairs

Hammer, nails, masonry chisel, pry bar, saw, trowel, putty knife, edging tool, pressure-treated wood, mortar mix, and epoxy glue.

How to Complete the Repairs

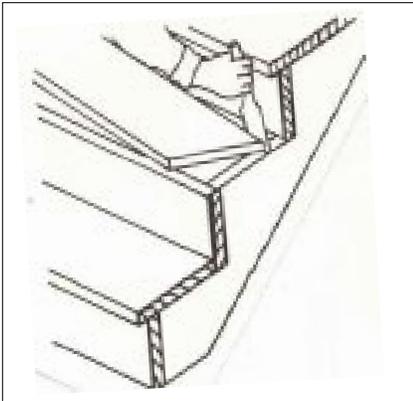


To replace a tread, strike the underside of the tread with a hammer.

Repairing wooden stairs: When the treads of wooden steps are worn, turn the treads over and re-nail in place. Flipping the board will save money and time. To remove the worn tread, carefully strike the underside of the tread at the nosing to free the tread from the riser below. Use a chisel or a pry bar to pry up the tread. The tread will also have to be disconnected from the stringer at the sides. If the worn tread has to be entirely replaced, use it as a model to cut a new board. Coat the new tread with a wood preservative and nail it in place. Use a rasp and sandpaper to duplicate rounded edges. To replace a riser, remove the tread above as saw off the exposed nails. Cut a replacement to the same size and coat with a wood preservative. Then nail the new riser to stringers.

Replacing a staircase: Most lumber yards sell stair stringers which are already notched, as well as tread lumber which has been milled to curve on one edge. Cut the new treads and risers to proper lengths. Then coat with a wood preservative and nail the treads to the stringers.

Repairing concrete stairs: Small cracks in concrete stairs can be repaired with concrete patching cement. Broken corners of a step can be reattached with a sand-cement-epoxy compound. Coat the broken piece with the compound and hold it firmly in place for ten minutes. Use a putty knife to remove any excess compound and to patch any cracks around the repaired piece.



Use a chisel to pry the tread free.

Rebuilding a corner: Using a mason's trowel, apply mortar to the step in the shape of the corner. Let the mortar harden for a few hours. Finish and smooth the corner flush to the step with a square trowel. Let the mortar cure for a week. Do not step on the corner for three weeks.

Repairing the chipped edge of a step: With hammer and chisel, chip off the damaged concrete all the way across the edge of the step. Chisel a V-shaped groove. Make a form board the same size as the riser and hold it in place with bricks. Coat the edge with cement paint and fill the groove with mortar. Let the mortar stand for an hour and then finish the step to rounded edge with an edging tool. Let the repair cure for a week.

For More Information...

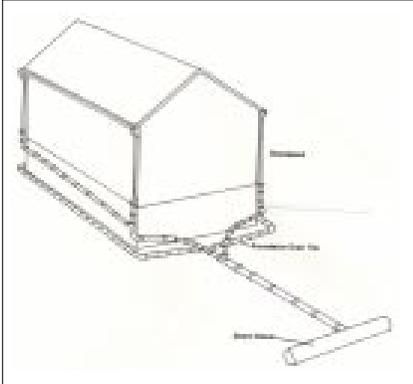
“Patching Limestone and Marble: A Step by Step Guide,” [The Old House Journal Compendium](#) – repairing limestone or marble steps, corners, and nosings.

[Preserving and Maintaining the Older Home](#) – repairing wooden risers and treads.

[Outdoor Home Repairs Made Easy](#) – repairing wooden and chipped concrete stairs.

[Time-Life Books Complete Home Repair Manual](#) – repairing chipping and spalling concrete stairs.

[Rehab Right](#) – diagnosing stair problems.

Drainage and Foundations**Inspection**

Gutters and downspouts must be connected to the storm sewer, **not** the sanitary sewer.

Drainage:

Inspect and clean downspouts, drains, and sewer laterals regularly. Regular cleaning will keep storm and sanitary drains free of roots and other debris. It will also help prevent rainwater from overloading the sanitary line and coming up through the basement drains.

Make sure that your downspout drains are not connected to the sanitary sewer. Downspout drains should be connected to the storm sewer.

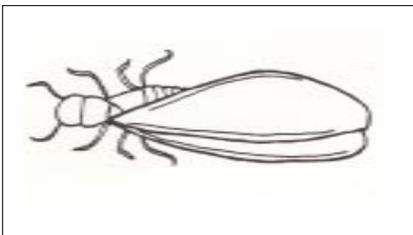
If downspouts are discharging water next to the foundation, attach drain tiles or drain pipes to carry water to the storm sewer system.

Use drainage pipes along the foundation and coat the foundation walls with a sealing compound to reduce basement dampness and leaking. The pipes are installed by digging a trench and laying the pipes so that they slope to carry water away from the house. Drain pipes are connected to drainage outlets.

Perfectly flat lawns or lawns with low spots may collect surface water. A line of drain tile one or two feet deep through the problem area can usually be hooked into the drain tile which carries water away from the house to the storm sewer system. Contact the Service Department to determine if the line you plan to hook into is connected to the storm sewer.

To divert water away from the foundation of your house, make sure that the ground slopes away from your house.

Keep drains in window wells clean and free of debris. Install covers over window wells to help prevent a buildup of debris and water. If a window well has a drain, a city ordinance requires the well to be built up a minimum of eight inches above the surrounding ground level.

Foundations:

Check for termites.

Check for termites at least twice a year. Inspect foundation walls for signs of shelter nodes or termite tunnels. Scrape away any termite debris that you find. Check any joints where wood meets concrete or masonry for termite damage.

Be sure that there is a good seal between your home's foundation and any adjacent patio, walkway or driveway. The potential for leakage at these joints can be reduced by caulking. Check to see that the caulking is resilient and that it fills the gap completely. If there are any breaks in the seal, re-caulk.

Examine the foundation for cracks in the mortar between blocks or stones, and for cracks in concrete walls. Any cracks should be repaired immediately before leaking water or temperature changes make the crack larger. Use mortar or waterproof patching compound to fill cracks.

Sometimes foundation cracks are structural. If a crack follows the mortar joints, it is probably a shrink crack which is not a structural problem. If a crack

begins in the mortar joints and continues through the masonry units of the foundation, it is a structural crack. Call a professional to assess and repair structural cracks.

Patch all cracks in masonry foundations and caulk the openings around any pipes which pass through these walls.

Should You Do It Yourself?

Repairs to small, non-structural cracks in foundation walls can be made without too much difficulty. If you suspect that a crack may be structural (as discussed under *Problem Assessment*), call a professional.

Hire a professional exterminator to deal with termite problems because termite-proofing often requires a great deal of excavation around the foundation. Also, the chemicals used in this process are highly toxic and should only be handled by an experienced professional.

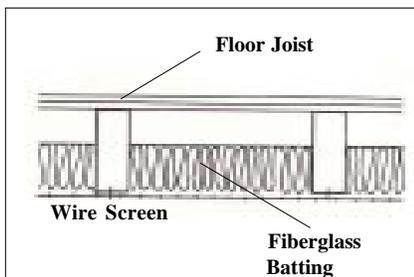
Approval from the City

A building permit is required for waterproofing foundations and for repairing underground laterals, drains or drain tile. The work must be done by a plumber or sewer builder who is registered to work in Shaker Heights.

Design Considerations

Crawl space vents are available in different designs and materials which are associated with specific architectural styles. Retain your home's original vents, if possible. If the vents are too deteriorated to save, try to replicate the original design and materials of the vents. In any case, vent openings should be no larger than 1/4" square to exclude rodents from the crawl space.

How to Complete the Repairs



Repairing a non-structural crack in a foundation wall: If the crack is on the exterior, clear away the soil and clean off the area around the crack. Use a hammer and chisel to remove loose mortar. Undercut the edges of the crack in a wedge shape so that patching material will be held in a wider cross section at the bottom of the crack. Use mortar or a waterproof patching compound to fill the crack. If you use mortar, complete the repair at a dry time of year so that leaking water will not ruin the patch before it cures.

Insulating a crawl space: Fiberglass batting, 3-1/2" thick, is usually sufficient for crawl space insulation. Place the insulation between the floor joists with the vapor barrier (the silver sheet on one side of the insulation) facing up, staple a wire screen to the bottom of the floor joists to secure the insulation in place.

For More Information...

[Outdoor Home Repairs Made Easy](#) – grading around foundations, carrying water away from the foundation.

[The Home Repair Book](#) – patching cracks in foundation walls, waterproofing foundations, dealing with termites.

The Shaker Heights Public Works Department (491-1490) – preventing basement flooding, information about drainage/sewer systems.

Inspection

Regular maintenance will increase the life of your outdoor lighting system.

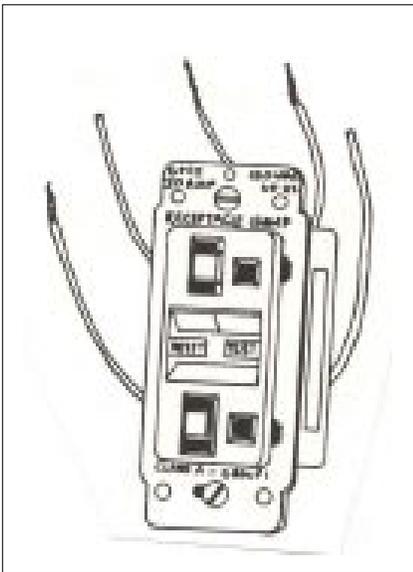
Every spring and fall, check outdoor fixtures for exposed wires. Replace at the first sign of wear or damage.

Outdoor light fixtures may be permanently wired to a house circuit or temporarily plugged into an outdoor outlet.

Exterior lighting must be protected from the elements by using waterproof covers or insulation.

Periodically remove leaves, dirt, and debris from fixtures. Also wipe cool bulbs and fixtures with a damp cloth to remove insects and dust. Replace any burned out bulbs. Use weatherproof bulbs instead of standard bulbs since these will not shatter from contact with rain or snow. Make sure bulbs are UL-listed for outdoor use.

Check joints between fixtures and exterior walls to see that they are watertight. Seal joints with a water-resistant caulking compound, such as silicone.

Problem Assessment

Ground fault current interruptor.

Ground fault current are a common cause of electrical shocks. To prevent shocks, a ground fault current interrupter **must** be installed on every exterior circuit.

When an outdoor fixture does not work, first check to see if the light bulb is loose or burned out. Next check for loose connections. Make sure the contact tabs in the socket are not dirty or bent.

If a porch or post light is not working or if it flickers, check for a blown fuse or a tripped circuit breaker. Also check for loose or burned out bulbs. If you still cannot pinpoint the problem, the outdoor circuit may be faulty. Have an electrician check the circuit and run a new one, if necessary.

A typical post light is three to eight feet high and is anchored in concrete. Check to see that posts, bollards, and ground lights do not have wobbling poles. If a light post is loose, it can be secured temporarily by driving wooden wedges into the hole around the post's base. If the post has heaved from frost action, remove it, deepen the hole, and reset it below the frost-line in concrete.

If low-voltage patio lights are not working, the problem could be a loose or burned out bulb, faulty socket or wires, or faulty wiring between lights. If more than one light is out, check to see if the transformer connections need to be tightened or cleaned. If this does not solve the problem, the fuse or transformer probably needs replacement.

Should You Do It Yourself?

Simple repairs to exterior fixtures can be accomplished without too much difficulty. Installing new fixtures is also a relatively simple procedure. Advice regarding the best outdoor lighting fixtures for your specific needs is available in many lighting stores.

If you have had no experience working with electrical systems, call a professional electrician for all repairs.

Call a professional electrician to do work on major underground cables and conduits, and to repair outdoor circuits.

Because of the potential danger involved, have a professional make repairs to deteriorated or rusty antennas, guy wires, and lightning rods.

Approval from the City

Before installing or updating an outdoor electrical system, you or your contractor must get a permit for electrical work from the Building Department.

Ground fault current interrupters are required for all outdoor circuits by the State Code.

Aerial lights require a permit from the Building Department. To install this type of light, you must follow a City ordinance with regard to shading so that light does not permeate into your neighbor's properties.

Design Considerations



A simple lantern fixture is appropriate for most traditional homes.

The key to effective exterior lighting design is to be very clear about what you want the lighting to do. Exterior lighting can serve several functions: safety, security, task lighting, and aesthetics.

Paths and entries should be lit with low-voltage fixtures.

Low-voltage lights can be planted in the ground with a spike. The low-voltage wires are either connected to the next patio light in the series or to the transformer. The transformer reduces the 120 volts to 12. Therefore, they cost less to operate and are safer to install. They can be bought in kits, in all shapes and sizes.

Security lighting is most efficient at the perimeter of the house and garage. Low-voltage lights close to the house eliminate deep shadows and create an attractive effect.

Exterior lighting fixtures should be compatible with the architectural style of your home

How to Complete the Repair

Before working on permanent outdoor fixtures or even changing a light bulb, turn the power off to the circuit. Be sure to use a wooden ladder for hard-to-reach fixtures.

For More Information...

Time-Life Books Compete Home Repair Manual – repairing outdoor lights.

“Housemending Notebook,” Category 15, pages 15.2, 15.3, 15.4. – choosing light bulbs and exterior lighting fixtures, exterior lighting design.

The Outside Handyman – Installing garden and porch lights, adding a new circuit.

Popular mechanics Home How-To – installing outdoor wiring, installing an outside receptacle.

Inspection

Inspect the overall condition of your garage annually. Assess whether it needs to be repainted or re-roofed. Check for rotted studs and sill plates. If the foundation deteriorates or settles too far, the studs and sill plates will rot because they will be resting directly on the ground where they can absorb moisture.

Check the concrete floor slab for cracks, spalling or uneven settling.

Garage doors should be inspected regularly to ensure smooth operation. Sectional overhead garage doors work on metal tracks; because they have so many mechanical parts, they need regular maintenance. Every six months, inspect the cables and springs for signs of excessive wear. Lubricate areas of the door moldings which come in contact with the door. Lubricate and inspect the rollers and pulleys annually. Check the entire track to make sure the bolts and screws fasteners are tightly secured. Inspect the top, bottom, and edges of wood doors, making sure that the door seals your garage from the weather.

Problem Assessment

Rotted studs and sill plates must be removed and replaced to keep the rot from spreading and causing more damage.

If an overhead garage door seems hard to lift or drops heavily, the spring tension may need tightening. If the door is hard to lower or tends to fly up when raised, the spring tension may need to be decreased.

Garage door binding may be caused by the track being out of alignment or twisted. Other causes might be that the door frame was knocked out of square or the tension springs were not equally adjusted.

Should You Do It Yourself?

It is best to have a professional replace rotted sill plates and studs and to repair garage doors, although some homeowners choose to make these repairs themselves.

Have a professional take a look at garage door spring problems. Some springs are under considerable pressure. If they break, you could be badly hurt. Only an expert should work with springs.

Make repairs to garage foundations and floor slabs **only** if you have masonry experience. Otherwise, call a professional. Also, have a professional place a new slab and footings if they have deteriorated beyond repair.

Approvals from the City

A building permit is required to build a garage or to place a new garage floor.

Plans for new garages must be approved by the Architectural Board of Review and conform to the Zoning Code. The maximum garage size allowed for a one-family dwelling is 600-800 square feet, depending on the Zoning district. The minimum size is a two-car garage. For a two-family dwelling, the maximum size is 800 square feet; the minimum size is a three-car garage.

Design Considerations

Garage doors either swing in or out, or they swing up inside the garage on a set of tracks. Traditional swinging doors are still found on some homes in Shaker Heights, but most homes have solid or sectional overhead doors.

New garages should reflect the architectural style of the house. They should be built with the same materials, especially siding and roofing, as the rest of the house.

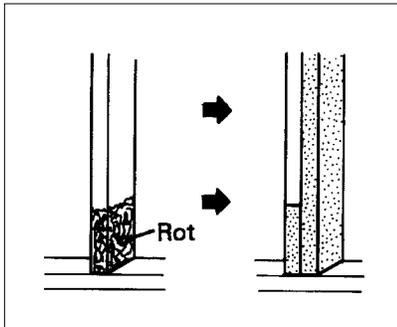
Select a simple design for the garage door so that it will not detract from the overall appearance of the house. A paneled door is an attractive alternative to a flush door.

Tools Needed for Repairs

Hammer, galvanized nails, stepladder, drill, screwdrivers, level, wrenches, sledgehammer, rubber mallet, pressure-treated wood, wood preservative, weatherstripping.

You may want to rent jack posts or bell jacks and a reciprocating saw when replacing rotted studs and sill plates.

How to Complete the Repairs



Repairing a rotted stud: Start by removing enough siding from the base of the walls to expose the rotted areas of the studs. Mark each piece of siding so you get it back in the same place. Repair rotted studs one at a time. Nail a new stud next to the rotted stud. Cut off the rotted section. Nail a new piece of wood as long as the rotted piece. Slide it under the remaining part of the stud and nail it to the new stud. Toe-nail the bottom of each new piece into the sill. Repeat these steps for all rotted studs.

Repairing a garage door: When the garage door is closed, check the track for dents and use silicone spray inside the tracks to reduce friction. Use a level vertically along the track on each side of the door to make sure the track is properly aligned. Adjust the track by loosening the brackets, tapping the track with a rubber mallet until it is vertical. Then tighten the brackets.

If there is a gap between the bottom of an overhead door and the floor of the garage, coat the bottom of the door with a wood preservative and nail weatherstripping to it. The weatherstripping should compress when the door closes.

For More Information...

[Housemending Notebook: Garage repairs you can do yourself](#) – repairing roofs and re-roofing, repairing rotted studs, repairing a rotted sill plate, squaring door openings.

[Your Home](#), Newsletter of the Housing Resource Center – fixing a leaky garage roof.

[Handbook of Exterior Home Repairs](#) – fixing garage door tracks, preventing rot and air leaks.

[Garages, Basements and Attics](#) – pouring footings and a slab.

[Home Repairs: 52 Easy Weekend Projects](#) – repairing garage doors.

[Popular Mechanics Home How-To](#) – repairing garage doors.

Inspection

Trim trees and shrubs once or twice a year. Older branches should be cut back at the base to allow for new growth. Prune trees and shrubs when they have dead branches or when a shrub is overcrowded with branches.

The tree lawn between the sidewalk and the street in front of your home is your responsibility. Keep it neatly trimmed.

Let grass clippings remain on your lawn rather than bagging them. Grass clippings decompose and add valuable nutrients to your lawn, while bagged clippings take up valuable landfill space. Another alternative is to keep a compost pile in your yard and add clippings to this pile. Check with the Shaker Heights Public Works Department for regulations and advice regarding compost piles.

Problem Assessment

Trees must not overhang the public right of way. They must be nine feet above grade. Limbs and branches should not rub against your home or garage. Shrubs which line a driveway should not obstruct sight lines.

Watch for signs of wilting and for yellowing leaves, starting at the top of the tree. Water all trees regularly, especially during dry summers. Do not keep diseased or dead elms for firewood. Consider fungicide injections for your trees. Fungicide should be injected into trees annually, with the assistance of a professional tree service company.

Should You Do It Yourself?

Most yard maintenance and upkeep can be accomplished without much difficulty. You might consider hiring a professional to prune trees or to develop landscape designs. A professional should also be hired to remove dead or diseased trees.

Approval from the City

You do not need a permit to do landscaping work or to remove a tree from your property.

You may apply for a rebate to remove dead or diseased elms from your property. Call the Shaker Heights Public Works Department for more information.

A permit from the Public Works Department is required to keep a compost pile on your property.

Design Considerations

Trees and shrubs should enhance a house, not hide it. They should be kept properly trimmed. Lawns should also be kept trimmed.

Apply lawn care chemicals sparingly and only when necessary. Lawn care chemicals can be toxic to your health and to the health of pets and wildlife. Some chemicals also leach through the soil and pollute the ground water supply. Whether you hire a lawn care company or apply chemicals yourself, be sure that you know the effects and potential hazards of the chemicals used.

Tools Needed for Yard Maintenance

Lawn mower, hedge clippers, hoe, edger, pruning shears.

How to Prune

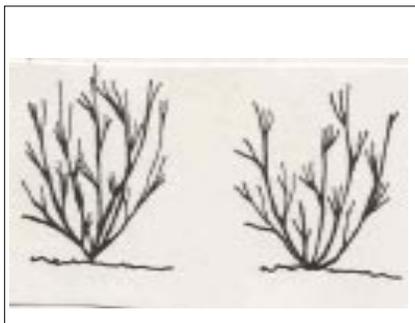
Trees and shrubs are pruned to remove dead, diseased, insect-infested or broken branches. Also, pruning can change the size and proportions of trees and shrubs to develop a special shape, like an espalier, topiary or hedge.

There are three basic methods of pruning:

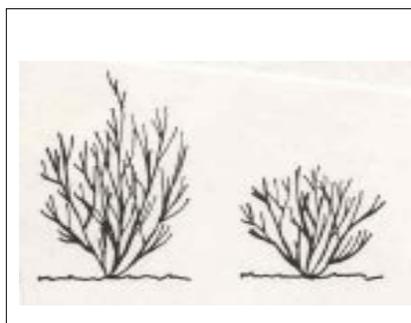
Thinning: Thinning involves removing some branches to open up a tree or shrub. This allows more light to reach inner branches so they can develop new growth more easily. Thinning is often used when pruning fruit trees.

Heading back: Heading back is the removal of the ends of branches at the same height. This causes new shoots to develop from dormant buds, making the tree or shrub thicker. Heading back is a technique used on a wide variety of trees and shrubs.

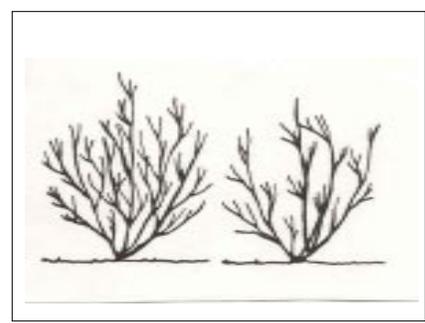
Renewal Pruning: Renewal pruning is the removal of old branches which are large and unproductive. The oldest branches on a tree or shrub are cut back to ground level. This results in the development of new branches. Renewal pruning is often used on flowering shrubs.



Thinning.



Heading back.



Renewal pruning.

For More Information...

The Shaker Heights Public Works Department (491-1490) – dealing with Dutch Elm disease.

[The Cleveland old House Handbook](#) – creating an attractive landscape for your home.

[The Home Repair Manual](#) – cleaning, maintaining, and repairing pools.

Introductory Horticulture – Pruning trees and shrubs.

[The Low Maintenance House](#) – designing low-maintenance lawns and gardens.

[National Pesticides Telecommunications Network](#), (800) 858-PEST.

[Shaker Magazine](#) (September 1990) – Dutch elm disease in the City.

“Watch Out for Chemical Lawn Sprays” (Available from the Council on Hazardous Materials, 861-6945) – Listing of hazardous chemicals commonly used for lawn care.