remodeling older minnesota homes

Extension Folder 268 – Revised 1978

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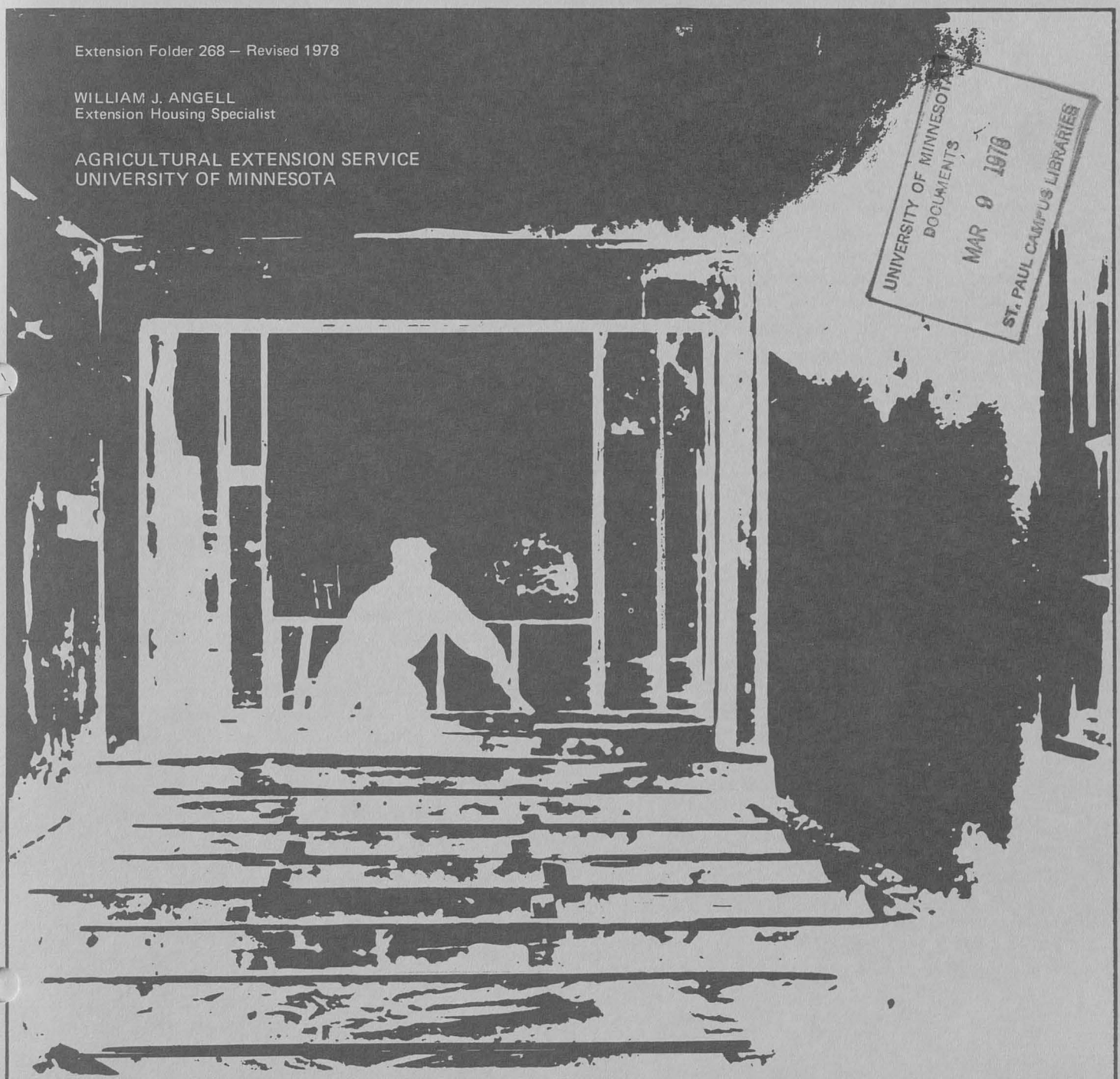

remodeling older minnesota homes

Remodeling is a popular method of improving a housing situation. This year more than 140,000 families, or about one of every six Minnesota families, will remodel their homes. In comparison, fewer than 10,000 families will build new homes.

Despite this popularity, each remodeler will be challenged by numerous complex and important decisions about such items as financing, materials, prices, plans, specifications, contracts, codes, etc. Furthermore, no single expert can accurately advise on all facets of remodeling, nor a single book guide through all remodeling situations. Thus it is understandable why remodeling is a major area of consumer complaint and why there appears to be so many unethical practitioners ready to take advantage of the unwary consumer.

The purpose of this folder is to help you gain basic knowledge to make your remodeling fun, exciting, and worthwhile. This folder will help you develop a personal step-by-step plan for achieving your remodeling goals. You will, for example, learn:

- the advantages and disadvantages of remodeling.
- the basic types of remodeling alternatives available.
- to what degree remodeling is and is not desirable for your situation.
- how to establish your remodeling plan.
- how to estimate and reduce your remodeling costs.
- how to avoid being cheated and how to obtain professional help.

After reading this folder and considering the condition of your home and the nature of your remodeling goals, you may wish to review one or more of the following folders (available from your county extension service):

- Evaluating Structural and Exterior Components—EF 301
- Evaluating Floor Plans—EB 408
- Evaluating Plumbing Systems—EF 343
- Evaluating Wiring—EF 300
- Evaluating Heating Systems—(expected September 1978)

When weighing the factors that influence the desirability of remodeling, you should first recognize the fundamental advantages and disadvantages of remodeling. With this understanding, remodeling may be approached with more realistic expectations and fewer problems and frustrations encountered. Consider the following advantages and disadvantages in terms of your own situation.

Advantages and Disadvantages of Remodeling

ADVANTAGES

- A family does not have to disrupt neighborhood and school ties nor endure the socio-psychological stress and uncertainty associated with moving.
- The substantial financial costs of selling, moving, and buying are avoided. (For homes in the $40,000 range, for instance, these expenses may be $5,000 or more.)
- If a homeowner has a mortgage with a relatively low interest rate (i.e. under 8 percent), he/she will not be forced to finance another house at a higher interest rate.
- Because a substantial portion of remodeling costs are for labor, a homeowner may choose a "do-it-yourself" plan and realize a sense of self-achievement while reducing costs and completing improvements as they can be afforded.

DISADVANTAGES

- A family may be dissatisfied with its house because of factors that cannot be changed by remodeling (e.g., unsatisfactory social or physical characteristics of the neighborhood, inconvenient location, zoning regulation prohibiting desired additions, etc.).
- Remodeling, especially rehabilitation and restoration, is complex. Homeowners seldom realistically estimate the cost and time required.

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- The dust, dirt, clutter, and inconvenience associated with remodeling may put a significant stress on family life.
- Home improvement financing generally carries a higher interest rate than that of a home mortgage. (NOTE: Some low-interest government home improvement financing has become available to low- and moderate-income homeowners in recent years.)
- Certain types of home improvement (e.g., wiring, plumbing, structural) should not be attempted by inexperienced remodelers whose sole motivation is to save money.
- Financial over-improvement is a common pitfall; especially when serious structural, exterior, and mechanical deficiencies exist or when the neighborhood has irreversibly declined. In such situations it is sometimes impossible to get home improvement expenses back through higher resale value.

After considering the fundamental advantages and disadvantages of remodeling, ask yourself: "Is remodeling my best housing alternative?" If the answer is yes, you will be ready to develop a remodeling plan.

The Remodeling Process

OVERVIEW

Remodeling a home, whether on a do-it-yourself basis, as a general contractor, or through a contractor, requires an understanding of the sequence of design and construction activities. For the do-it-yourself remodeler, this understanding is essential if time-consuming bottlenecks and other costly mistakes are to be avoided. The do-it-yourself remodeler must be able to organize work, direct sub-contractors, insure delivery of material, and even adjust schedules and plans when unexpected problems develop (bad weather, strikes, equipment breakdowns, and other common "surprises" of remodeling). To gain this expertise, the do-it-yourselfer must thoroughly understand the tasks involved and their critical interrelationships in remodeling a home.

Formal and graphic methods of determining (and illustrating) important activities and relationships are known as flow diagrams, Performance Evaluation and Review Techniques (PERT), or as Critical Path Methods (CPM). These methods isolate the critical steps involved in any process, including remodeling. To use these methods for planning, analyzing, or scheduling a project, three simple questions must be answered:

- What steps must be completed before this step begins?
- What steps can be carried on concurrently?
- What steps cannot begin until this one has been completed?

Depending on its sophistication, a flow diagram may include time estimates for completing each step, as well as a schedule of individuals and materials necessary to accomplish the activity. At a minimum, it indicates individual events or activities and the relationship or flow between activities. Generally, either squares or circles are used to indicate specific events or activities, whereas lines and arrows indicate the flow or interrelationship between the activities.

Simple flow diagrams, along with brief annotation, are presented in the fold-out insert to this folder. These diagrams represent an average or typical flow of activities in the planning and construction stages of remodeling a house. After reviewing them you should have a basic understanding of remodeling.

REMODELING ASSESSMENT-PLANNING PHASE

Remodeling a house requires careful planning and efficient management of labor, equipment, materials, and finances as well as a complete assessment of the existing condition of the dwelling. Each step of the remodeling process must be recognized and then organized progressively. With adequate planning and efficient management, the do-it-yourselfer can save money and time as well as avoid unnecessary problems.

The important phases of assessment and planning include:

- reviewing relevant literature and learning common building terminology.
- assessing the existing condition of the structure, mechanical systems, exterior components, and interior elements.
- considering remodeling priorities and alternatives.
- estimating necessary financial and time demands.
- talking with building experts.
- observing remodeling construction.
- developing a complete set of working drawings (plan) and detailed specifications.
- selecting material suppliers and subcontractors.
- obtaining financing and necessary permits.

The flow diagram and explanation on the enclosed fold-out describes the sequence of assessment-planning stages.

REMODELING CONSTRUCTION PHASE

After plans and specifications have been completed, actual construction can begin. If you wish to subcontract any work or do work yourself, it is imperative that you understand each step and the logical progression of work within the remodeling construction process. With this understanding, you can efficiently schedule work and delivery of materials to reduce waste, delays, and unnecessary costs.

Remodelers planning extensive improvements, especially on a do-it-yourself-basis, should develop their

own flow diagram complete with time estimates and a listing of subcontractors, material suppliers, and others involved with each step.

Basic Types of Remodeling

You must recognize the difference between remodeling (or improvement) and maintenance, especially if you are concerned about recovering a financial investment through a higher resale value. This difference is illustrated in the examples in table 1.

While "deferred maintenance" may necessitate expensive work on a home, maintenance expenditures do not substantially increase the value of a home. Rather, maintenance expenditures simply bring the home up to a level that buyers expect in the first place and for which buyers are generally unwilling to pay extra. Maintenance expenditures are necessary simply because of normal wear and tear.

Remodeling or improvement expenditures, on the other hand, generally increase the value of a home and increase the livability beyond that of normal maintenance, repair, and replacement. The need for maintenance may, however, stimulate the desire to remodel. For example, if the time has arrived to replace kitchen appliances, you may wish to take advantage of the situation to remodel the kitchen. In fact, whenever you are considering remodeling, you should also consider correcting maintenance problems that have been allowed to exist. Furthermore, you should recognize the three basic types of remodeling, each involving a different purpose and carried out in a different way.

Table 1. Common maintenance and remodeling jobs

Maintenance jobs	*Remodeling jobs*
Reroofing	Enclosing a porch
Repainting	Finishing off an attic
Replacing deteriorated siding	Building an addition
Replacing deteriorated windows	Installing new windows
Correcting basement moisture	Finishing off a basement
Replacing unsafe wiring	Adding circuits to wiring
Replacing deficient plumbing	Installing a new bathroom
Replacing deteriorated beams	Installing new doorways and walls

REHABILITATION

The majority of remodeling efforts and proportionately the largest amount of remodeling expenditures (75 percent) are motivated by the desire to rehabilitate (improve) existing features of the home. Examples are remodeling the kitchen or bathroom, or combining two bedrooms into one. Rehabilitation of existing features of the home requires assessing and correcting existing deficiencies in structural, exterior, interior, and mechanical (heating, plumbing, wiring) components.

RESTORATION

A small but increasing number of remodeling efforts are motivated by the desire to restore the original architectural character, design, materials, decor, and other features of a home. Restoration often requires removing careless "improvements," made by previous owners, which have destroyed or camouflaged the original character of the home. Restoration may also involve installing "modern" mechanical systems and improvements that do not detract from the original character of the home yet provide maximum livability. Restoration is the most challenging type of remodeling, requiring the greatest amount of study and professional help.

ADDITION

The third type of remodeling is motivated by the desire to add or increase the amount of livable space through either an *exterior addition* (i.e., building a new attached room) or an *interior addition* (i.e., finishing an attic or basement, converting a porch or garage to year-round use). Additions, either to or within the home, require assessing the capability of expanding or supplementing existing mechanical systems. Interior additions also require assessing and correcting existing deficiencies in structural and exterior components (e.g., waterproofing the basement and reroofing the porch before finishing it off.)

Although complete and conclusive figures are not available for Minnesota, it is possible to estimate the type of remodeling activity taking place in the state during an average year. As illustrated in table 2, more than half of the remodeling projects involve rehabilitating existing features. Since rehabilitation requires removing existing materials (e.g., ripping out old flooring, walls, and cabinets, etc.), homeowners are slightly more likely to be physically involved in the actual work than is true in exterior additions. As will be illustrated later in this folder, almost any homeowner can save a substantial proportion of the costs of remodeling by performing simple, labor-intensive tasks.

When Is Remodeling Desirable?

If you are considering remodeling your present home or buying and remodeling an older home you should realize that investing in home improvement may not be desirable. For some families, it would be most desirable to select or build another house that more closely meets the family's desires and resources. When weighing the wisdom of home improvements, measure the desirability of remodeling against both personal and financial yard-sticks.

Table 2. Estimated types and methods of remodeling projects in Minnesota (annual average)[1]

Types of remodeling projects	*Number*	*Completely do-it-yourself*	*Partially do-it-yourself*	*Completely contracted*
Rehabilitation	98,000	58%	24%	18%
Kitchen	52,000	—	—	—
Bathroom	46,000	—	—	—
Additions	90,000	53%	24%	23%
Exterior	30,000	41%	28%	31%
Rooms	15,000	—	—	—
Garages or carports	15,000	—	—	—
Interior	60,000	59%	22%	19%
Basement finishing	26,000	—	—	—
Porch enclosure	17,000	—	—	—
Bathroom installed	13,000	—	—	—
Attic finishing	4,000	—	—	—
Restoration	NK (not known)	NK	NK	NK

[1]The data in this table were derived from figures presented in the November 1975 issue of *Building Supply News* and according to the methodology described in Extension Folder 318, *Housing Alternatives.* It should be emphasized that these estimates have been presented only to illustrate the order of magnitude of remodeling, thus they may vary substantially in scope and character during any specific year.

REMODELING FOR PERSONAL REASONS

Most people are motivated to remodel for personal reasons such as the desire to improve comfort, convenience, prestige; the desire to "save" a special, architecturally significant house; the desire to improve an old family homestead; or simply because the family has grown or patterns of living have changed. If personal reasons are a strong motive underlying the desire to remodel, carefully consider three questions.

1. **How long will you or other family members continue to live in the house to enjoy the desired improvements?** For example, if you want to finish off the basement so your children can entertain friends, this will be worth the cost only if your children will continue to live at home for several years.
2. **Will the desired improvements achieve basic goals or only remedy symptoms of the problems?** For example, if you want to finish off the basement so your children will have a place to entertain friends, this is practical only if you remedy existing moisture, lighting, and heating problems as well as install paneling, carpeting, and ceiling tile.
3. **Does the home have architectural or family significance?** Some people feel that anything old should be saved. With increasingly scarce energy resources, smaller families, and other changes, justifying remodeling primarily on an architectural or sentimental basis should be carefully reexamined.[1]

REMODELING FOR FINANCIAL REASONS

Although homeowners seldom recover 100 percent of their total financial investment (labor and materials)[2] when selling a remodeled home, certain types of remodeling more favorably affect resale value. Since homeowners move an average of once every 7 years, it is wise to consider investment and cost aspects of remodeling. At least three factors influence the investment and cost wisdom of remodeling.

1. **The location of the house.** When remodeling, you invest in a neighborhood and community as well as in a dwelling. Some of the important locational factors to consider are (positive factors):
   - in comparison with other dwellings in the neighborhood, will the value of the home after remodeling be less than 20 percent greater than the average?
   - does the neighborhood contain, or is it close to, desirable natural and scenic features such as a lake, unpolluted river, bluffs, trees (other than elms), etc.?
   - does the neighborhood contain, or is it close to, desirable features such as homes of architectural or historical character, good schools, shopping places, employment centers, cultural facilities, and are there few vacant lots (allowing for undesirable development)?
   - does the neighborhood contain a desirable mix of human features such as a strong neighborhood organization, a high or increasing proportion of home owners, etc?
2. **The comparative condition of the house.** Most buyers *expect* a house to meet a standard similar to other homes of the same age, price, location, size, etc. Thus, if remodeling is planned to correct foundation, structural, or mechanical deficiencies and to bring the home to the expected standard,

[1]The "architectural or family significance" rationale for remodeling may be a very valid reason to remodel. It is important to realize, however, that restoration is generally very expensive and time-consuming to properly carry out. Furthermore, increasing energy costs and maintenance expenses usually dictate improvements that cannot be economically justified for homes which have structurally deteriorated.

[2]When considering whether the costs of remodeling are justified in terms of higher resale value, realize that:
- inflation has increased, and will probably continue to increase, average resale values more than the home improvement projects (i.e., the same basic home built in 1967 cost about 100 percent more to build in 1977).
- some improvements may reduce monthly costs (e.g., additional insulation reduces heating and cooling costs).
- some improvements may increase monthly costs (e.g., a room addition increases financing costs, property taxes, insurance, utility and maintenance expenses).
- the costs of home improvements can be deducted from "capital gains," which are taxable. (This is the reason a homeowner must keep all receipts associated with home improvements.)
- the costs of home improvement may be reduced if you do your own labor.

Table 3. Resale and investment considerations for selected home improvements

Type of improvement and approximate 1977 material-labor costs[1]	*Financial resale and investment considerations*
KITCHEN REHABILITATION–$4,610 to $6,988–new range, oven, refrigerator, dishwasher, sink, plumbing, wiring and fixtures, countertops, cabinets, ceiling and wall drywall, casement window, flooring. BATHROOM REHABILITATION–$2,005 to $4,090–new tub, lavatory and vanity, toilet, vent fan and light fixture, GFIC wall receptacle, ceiling and wall drywall, casement window, wall-floor ceramic tile.	Minimal cosmetic improvements, especially those at eye level (e.g., cabinets, counters, walls), are generally better financial investments. Extensive kitchen and bathroom rehabilitation tend to be financially wiser if: a) their condition is substantially below that of the remainder of the house; b) major appliances are near the end of their service life; c) wiring or plumbing is substandard; and d) fixtures, walls, floors, ceilings are beyond simple repair.
BASEMENT FINISH (INTERIOR ADDITION)–$5,025 to $6,533–800 square feet finished with furred and insulated walls, ceiling and wall drywall, carpeting, wiring and fixtures, ¾ bath connected to existing plumbing stubs. ATTIC FINISH (INTERIOR ADDITION)–$3,792 to $4,696–575 square feet finished with partition and kneewall framing for two bedrooms and ½ bath, fixtures connected to existing stubs, wiring and fixtures, ceiling and wall drywall.	Resale value varies substantially according to interior additions within existing space. Basement investments tend to be very poor especially if basement: a) is completely below grade; b) is cold, damp, or wet; c) lacks 7 feet or more of headroom. Above grade investments, such as finishing an upper ½ story space, tend to be better if: a) a third or fourth bedroom is obtained; b) a bath can be connected to existing plumbing; c) adequate head room and ventilation can be achieved.
FAMILY ROOM EXTERIOR ADDITION–$6,559 to $10,976–180 square feet of foundation, framing, sheathing, siding, roofing, casement windows, wiring and fixtures, ceiling and wall drywall, carpeting, metal fireplace.	While generally more expensive than similar new construction, exterior additions tend to be better financial investments if: a) the improvement adds space found in similar priced houses; b) the home's existing condition is sound; c) the lot is large enough to accommodate addition; d) the addition is functionally and aesthetically connected to the home.

[1]These costs have been estimated by Martin Meldahl and members of the Duluth Housing and Redevelopment Authority (HRA); Tom Goodwin of the Minneapolis Housing Bureau; and Warren Frost and members of the St. Paul Housing and Redevelopment Authority. **The costs of these improvements will vary by: the specific condition of the dwelling, the quality of materials used, and the amount of "do-it-yourself" work.**

only a minimum proportion of the remodeling costs will be recovered through a higher resale value. Such improvements, however, may be necessary to simply make the home safe and saleable at any price.

3. **The improvement.** If the improvement being planned is something that buyers in general desire in homes similar in age, price, size, and location, then the improvement will have a more favorable impact on resale value. In fact, some improvements can make the house more difficult to sell by eliminating some of the potential market. As illustrated in table 3, the "relative cost" as well as the type of improvement must be considered in combination with the location and original characteristics of the house.

   Since the individual homeowner's situation will vary significantly from that described in table 3, it is desirable to contact an "independent fee-appraiser" and to request an appraisal of the market value of the house ("as is") and the desired improvements. If the costs of improvements are less than the increased market value, then the improvement is financially justified.

   Another method of determining the financial wisdom of remodeling is to compare the cost of the improvement with the cost of moving to a home which includes the desired feature(s). Table 4's format may be used to evaluate the financial desirability of remodeling.

Dwelling Assessment Considerations

A critical initial step in developing a remodeling plan involves a complete assessment of the existing condition of the dwelling. This evaluation should form the basis of your remodeling plan and include an identification of existing and developing foundation, structural, exterior, plumbing, wiring, heating, floor plan, and interior deficiencies; a description of the basic cause of these problems; and finally, a listing of these problems in order of severity.

To more accurately complete an assessment of a dwelling prior to remodeling, you may wish to call upon one or more of the following individuals.

PRIVATE FEE INSPECTOR

In most areas of Minnesota private practicing engineers or individuals knowledgeable about construction will thoroughly inspect a house for a fee (generally $50 to $150 depending on driving distance and services rendered). Following the inspection, you will receive a listing of deficiencies. You can then consult with the inspector to develop a list of problem priorities. To locate a private fee inspector, look in the

Table 4. Homeowner's comparative cost assessment of remodeling

STEP ONE—Estimate the itemized costs of the desired home improvements.

Material (including sales tax)		$_____
Labor		+_____
Contractors' overhead and profit		+_____
Building permit fees		+_____
Other (attorney, temporary housing, etc.)		+_____
• TOTAL INITIAL IMPROVEMENT COSTS (add above lines)	=	$_____(1)

STEP TWO—Estimate the itemized costs of buying or building another house which will be similar to what you desire (i.e., your present home with improvements).

Purchase price		$_____
Initial costs (taxes, financing, etc.; about 1 to 2 percent of purchase price)		+_____
Moving costs		+_____
Other related costs (appliances, draperies, etc.)		+_____
• TOTAL COSTS OF MOVING (add above items)	=	$_____
(subtract) Selling price of present home		-_____
(add) Selling costs (range from about 2 to 10 percent of selling price)		+_____
• NET OUTLAY OF MOVING TO ANOTHER HOUSE (total)	=	$_____(2)

STEP THREE—Request an appraisal of your home "as is" and an estimate of market value after improvement.

Market value after improvement		$_____
Market value "as is"		-_____
• NET CHANGE IN VALUE (subtract "as is" from improved value)	=	$_____(3)

INITIAL COST COMPARISON—Compare the following items:

- TOTAL INITIAL IMPROVEMENT COSTS (1) $_____(1)
- NET OUTLAY OF MOVING TO ANOTHER HOUSE (2) $_____(2)

If the initial improvement costs (1) are less than the net outlay of moving (2), then, financially, remodeling is justified.

INVESTMENT COMPARISON—Compare the following items:

- TOTAL INITIAL IMPROVEMENT COSTS (1) $_____(1)
- NET CHANGE IN VALUE (3) $_____(3)

If the initial improvement costs (1) are less than the net change in value (3), then, financially, remodeling is justified.

yellow pages of the phone directory under "Home Inspection."

MUNICIPAL INSPECTOR

In each community or county of Minnesota there are one or more local building officials or inspectors. Depending on the experience and specialization of these individuals (quite reliable in larger communities), they may be an excellent source of assistance for the assessment of a dwelling prior to remodeling. In most communities, for example, the following types of inspectors are available:

- Building inspectors—knowledgeable about foundation, structural, and exterior components and problems.
- Electrical inspectors—knowledgeable about wiring methods and problems.
- Plumbing inspectors—knowledgeable about plumbing systems and problems.
- HVAC inspectors—knowledgeable about heating, ventilation, and air conditioning (HVAC) systems and problems.
- Housing inspectors—knowledgeable about minimal health and safety standards and problems.

These inspectors may be available in several ways, depending upon the community:

- In an official, enforcement capacity. In communities with a housing code[3], a homeowner may request a "Certificate of Code Compliance." For a modest fee (generally about $50), you will receive an inspection and listing of code violations which are serious problems. Before requesting a "Certificate of Code Compliance,"

[3]A housing code is quite different from the building code. Whereas a housing code establishes minimum standards for *existing* conditions, the building code establishes a minimum standard for *new* construction.

however, you should realize that you probably will be legally required to correct code violations.

- In an official, non-enforcement capacity. Occasionally, municipal inspectors may be available for a modest fee to make inspections for homeowners. These inspections do not legally bind you to correct deficiencies. The non-enforcement inspection is common only in communities and neighborhoods where there is a special renewal effort and in communities where the inspector may have a schedule permitting this special service.
- In a non-official, non-enforcement capacity. Occasionally, municipal inspectors will be available, on a consulting-fee basis beyond their normal official enforcement duties, to perform individual consultations.

To determine the availability of municipal inspectors, check the phone listings under the local unit of government for building inspection.

CONTRACTORS

If neither private fee nor municipal inspectors are available in the community, you may wish to contact one or more local contractors who specialize in remodeling and ask if they would make an inspection. Exercise caution, however, and recognize that the contractor may be interested in getting a remodeling job. To reduce this bias, it may be more desirable to hire the contractor for only the inspection—emphasizing that a complete assessment is the most important need at the moment.

ARCHITECTS

An architect is generally most knowledgeable about design considerations. Those who have been in practice for a number of years and specialized in residential work may also feel knowledgeable enough to assess structural and mechanical systems. You may wish to hire an architect for the inspection. Fees generally range from $100 to $400 depending on driving distance and services rendered. To locate an architect specializing in residential work, request a listing from the Minnesota Society of Architects (314 Clifton Ave. S., Minneapolis, MN 55403).

Design Considerations

After completing an assessment of the home and considering alternative solutions, the next step involves organizing ideas into a workable design. It is not unusual to consider a dozen or more possible plans or rough sketches. In fact, it is desirable to invest effort and paper into examining alternative designs rather than to encounter expensive changes after construction has begun.

The critical steps in design involve selecting, consolidating, and organizing alternatives into a complete set of work drawings (plans) and specifications. These steps are necessary to obtain reasonable estimates of cost; to communicate with contractors and tradespeople; to obtain materials, financing, and building permits; and to avoid costly mistakes and delays. To complete this important step you may consider several alternatives.

SELECT AN ARCHITECT

When improvements are complex (especially restoration), expensive, or substantial in scale, you may wish to seek the services of an architect. These services may include:

- consultation and advice on specialized segments of the design such as plan review (available on an hourly or fixed fee basis).
- developing rough plans of design options (hourly or fixed fee).
- developing complete working drawings and specifications (hourly or fixed fee or percentage of the total costs of the improvement).
- supervising the entire improvement including developing the plan and specifications, soliciting bids, and inspecting work as it proceeds (usually for a percentage of total costs of the improvement).

It is important to recognize that the best architect will be one who is interested and experienced in remodeling. To select an architect, request a listing from the Minnesota Society of Architects (314 Clifton Ave. S., Minneapolis, MN 55403) or talk with friends and neighbors to identify architects who have done work similar to that desired.

SELECT A SPECIALIZED DESIGNER

If improvements are restricted in scale to rehabilitating only the kitchen or bathroom or to a room addition, you may wish to seek the services of a specialized designer. Contractors and material suppliers who specialize in one area of remodeling generally employ or can recommend a designer. Recognize, however, that a specialized designer employed by a contractor or material supplier is usually interested in selling the services or products of his or her employer. To select a specialized designer, exercise the same care as in selecting a remodeling contractor. Be sure to understand what, if any, charges will be made for the design service and if there will be a commitment to buy materials or to complete the improvement through a specific contractor or supplier.

DO THE DESIGN WORK YOURSELF

The problem with many home improvement magazines and adult education courses is that they create

Table 5. Remodeling specifications

For Sam Johnson
(owner)
At 331 Elm Drive, Vacuum, MN
(job address)
Prepared by John Doe and Company
Date 4-1-77 *Page* 1 *of* 12

Housing maintenance

I. Interior housing
- A. Special conditions
  1. This Work Write-Up describes the rehabilitation work to be performed on the subject property. The contractor will be required to do all work in a workman-like manner.
  2. Whenever painting is mentioned in the specifications, or whenever there is a choice of color, pattern, etc., *verify with owner.*
  3. Attention: All sizes, quantities, and measurements indicated are close approximates. It is the contractor's responsibility to determine all needs to complete total rehabilitation identified in this set of specifications.
  4. Homeowner to prime, paint, stain, and finish all new gypsum surfaces, wood, and wood trim being repaired or replaced as identified in this set of specifications.
- B. Basement
  1. Structural
     a. Install one post footing 24"x24"x12" between chimney and west foundation wall (support beam sags—span too long).
     b. Install pier block and 8x8 construction fir post for item "a".
     c. Install pier block and 8x8 construction fir post for other deteriorating beam post.
  2. Crawl space (under pantry and rear entry)
     a. Install 1" styrofoam against perimeter blocks.
     b. Insulate cap with 6" fiberglass insulation (from block tops to subfloor around perimeter).
     c. Cut hole through concrete blocks from existing basement to crawl space for ventilation.
     d. Lay poly-vapor barrier over ground in crawl space.
  3. New basement plumbing wall
     a. Location—5' from north foundation wall with new frame wall to be 8' long eastward from west foundation wall. Laundry on southside of wall.
     b. Install ½" gypsum board on south side only of new wall.
     c. Tape and sand.
     d. Approximate materials required for new wall:
        3—2x4—8' construction fir—bottom and top plates.
        8—2x4—8' construction fir—wall studs.
        2—4x8—½" gypsum board.
  4. Stairs to first floor
     a. Remove existing treads, jacks, upper and lower platforms.
     b. Rebuild stairs and platforms using the following:
        i. 3—2x10—10' for stair jacks.
        ii. 2x6 for platform joists.
        iii. ½" C.D. fir plywood for platform subfloors.
        iv. 3/8" masonite primed primecote for platform finished surface.
        v. Metal stair nosing for platform edges (2-3' pieces).
        vi. 10—5/4x10—3' clear fir round nose treads.
        vii. 11—1x8—3' clear fir risers.
        viii. Install fir handrails for upper and lower stair sections using metal handrail brackets.

For Sam Johnson
(owner)
At 331 Elm Drive, Vacuum, MN
(job address)
Prepared by John Doe and Company
Date 4-1-77 *Page* 11 *of* 12

Mechanical

IV. Plumbing
- A. Special conditions
  1. This Work Write-Up describes the rehabilitation work to be performed on the subject property. The contractor will be required to do all work in a workmanlike manner.
  2. All new waste and vent piping shall be installed with code approved materials. Verify all locations and patterns and colors with owner.
- B. Basement
  1. Waste and vents
     a. Install one new cleanout in main stack above floor.
     b. Replace cracked 4x2 wye in stack.
  2. Laundry equipment
     a. Disconnect and remove existing laundry tray, waste, and vent.
     b. Install new 16MF single compartment laundry tub on the southside and at east end of new plumbing wall described in general specifications.
     c. Washer to be installed on the immediate westside of new laundry tub.
     d. Install dryer between washer and west foundation wall.
  3. Water heater
     a. See heating section for vent pipe instructions.
- C. First floor
  1. Kitchen
     a. Remove illegally installed wall hung sink, waste and vent lines.
     b. Install new Dayton 33"x22" double compartment stainless steel sink. See plan for new location.
     c. Install code waste and vent for new sink.
     d. Install Moen Chateau faucet and spray hose for new sink.
     e. Install owners dishwasher per plan.
     f. Install owners gas range on east wall per plan.
- D. Second floor
  1. Bathroom
     a. Study plan carefully.
     b. Remove existing tub, basin, stool, and discard.
     c. Remove old lead waste and vents.
     d. Install new waste and vents for fixtures.
  2. Bathtub
     a. Install new Kohler K715S cast iron 5'x14" tub.
     b. Install new trip lever and pop up drain.
     c. Install Moen Chateau tub and shower faucet and install shower spray head.
     d. Install proper plumbing inspection door and trim for tub.
  3. Basin
     a. See general specifications for vanity and vanity sink to be furnished by general contractor.
     b. Install Moen Chateau lavatory mixing faucet.
     c. Install code "P" trap.
  4. Stool
     a. Install new Kohler K3512 PB closet
     b. Install standard white wood toilet seat.

the false impression that anyone can be a home designer. A course and a stack of books and magazines will no more make you a successful designer than it will make you a doctor, a pilot, or a salesperson. Each person, however, does have some level of design appreciation and skill. If you believe you have this appreciation and skill, are willing to seek professional assistance whenever it is needed, are willing to invest the time to gain necessary knowledge, and are considering a project of reasonable scale (generally small), then handling design and drafting responsibilities may be desirable.

Many experts familiar with remodeling emphasize that one of the most important items in remodeling is to have a *complete* set of specifications outlining *exactly,* in detail, what work is to be done, how it is to be done, and what materials are to be used. Whereas the working drawings (plans) communicate where work is to be done, the specifications communicate what and how the work is to be done. Table 5 illustrates an actual example of remodeling specifications. It includes two of twelve pages of specifications for a satisfactory remodeling project.

If an architect or specialized designer is hired to develop the remodeling working drawings, he or she will also generally prepare the specifications. Before requesting bids or turning the job over to a contractor, insure that the specifications detail:

- what work is to be completed.
- how the work is to be done.
- what materials are to be used and how they are to be finished.
- exactly where the work is to be done.
- that all work will be in compliance to all applicable codes.

Financing and Cost Considerations

Many home owners finance the costs of more modest remodeling with cash savings or by spreading the project over a period of years and paying as they can afford it. In addition to the inconvenience of improvements spread over time, some major projects necessitate seeking a home improvement loan or financing. You should recognize several important factors if you will seek financing:

- first and foremost, the cost of financing (interest rate) varies substantially between lenders and types of loans.
- second, you should compare the annual percentage rate (APR) or simple interest rate. Some lenders will quote the "discount" or "add-on" interest rate which is more expensive than the same APR or simple rate. Furthermore, installment or "add-on" financing penalizes the borrower who prepays the loan (e.g., upon sale of the house).
- third, the rationale of borrowing as little as possible, for the shortest period of time is not always best. Borrowing what is needed to complete the job at one time has several advantages. It is possible to save money and time by doing one large improvement job rather than a series of small jobs. Construction costs will probably continue to increase at the annual rate of 10 percent or more (experienced in recent years); by doing the work now, an owner can avoid these increases. The dollars with which the loan will be repaid will be worth less in the future while the value of improvements will increase if inflation continues. Finally, the cost of interest is income tax deductible and therefore the "true" costs will be less.

To obtain financing, you generally will be required to complete an application and present a complete set of plans and specifications to the lender. In turn, the lender will make the loan based upon three factors (often called the three C's):

- capacity—the borrower's ability to repay the loan (e.g., verified husband's and wife's dependable income); the borrower's net worth (e.g., verified savings and other equity minus debts).
- character—the borrower's past credit record of paying obligations.
- collateral—the security the borrower is willing to put up as a sign of intent to repay the loan as scheduled.

TYPES OF IMPROVEMENT FINANCING

There are a substantial number of financing alternatives. These include (amounts and rates as of July 1, 1977):

- **FHA Title One Property Improvement Loans**—available through banks, credit unions, and savings and loan associations; maximum of $15,000 for 15 years, at 12% maximum interest.
- **FHA Section 203 (K) Title Two Loans**—available (but infrequently used) through banks and savings and loan associations (generally for homes over 10 years old); maximum of $17,400 for 20 years at 8½% interest plus ½% FHA insurance.
- **FHA Section 312 Loans**—available through local Housing and Redevelopment Authorities for homes located in urban renewal and code enforcement areas and needing improvements to correct code deficiencies; maximum of $17,400 at 3% interest for a maximum of 20 years.
- **MHFA Home Improvement Grants**—available through local Housing and Redevelopment Authorities or Community Action Agencies (list available from Minnesota Housing Finance Agency, 480 Cedar St., St. Paul, MN 55101) to homeowners with adjusted incomes of $5,000 or less and assets of $25,000 or less (excluding personal property and present home) and for basic energy-saving, safety, physical handicap accessibility, or code compliance improvements; maximum grant of $5,000.
- **MHFA Home Improvement Loans**—available through participating banks, savings and loan associations, and local Housing and Redevelopment Authorities (list available from Minnesota Housing Finance Agency, 480 Cedar St., St. Paul, MN 55101) to homeowners with adjusted incomes under $16,000 for improving homes at

least 15 years old or with safety deficiencies or needing improvements for physical handicaps, or needing energy conservation improvements; maximum of $15,000 at 1% to 8% interest (depending on income) for a maximum of 15 years.

- **Local Home Improvement Grants**—available through larger local Housing and Redevelopment Authorities to lower-income homeowners or to moderate-income homeowners with high monthly housing expenses (grant may be restricted to improvements correcting code violations); maximum grant varies.
- **Local Home Improvement Loans**—available through larger local Housing and Redevelopment Authorities to homeowners experiencing difficulty obtaining financing from other sources; terms vary, although interest rates are frequently 4 to 8% depending on income, and loan amounts may be restricted to certain types of improvements.
- **FmHA 504 Home Improvement Loans and Grants**—available through county Farmers Home Administration offices to lower income homeowners in rural communities with populations of 20,000 or less who are unable to obtain reasonable credit elsewhere for repairs or additions to make homes safe, sanitary, and decent; maximum of $5,000 for 10 to 20 years at 1% interest (grants available to low income homeowners, 62 years old or older).
- **FmHA 502 Home Mortgages**—available through county Farmers Home Administration offices to moderate income homeowners and buyers in rural communities with populations of 20,000 who are unable to obtain reasonable credit elsewhere or less for purchase, repair, or construction of adequate but modest homes; 1 to 8% interest (depending on income) for a maximum of 33 years.
- **Special Weatherization Loans**—available through participating utility companies and cooperatives to homeowners making energy conservation improvements; terms vary substantially.
- **Special Weatherization Grants**—available through county and community action councils to low-income homeowners desiring to insulate, weatherstrip, caulk, install storm windows, or replace furnace (maximum grant of $350 of which 90% must be spent for materials).
- **Special Welfare Grants**—some counties allocate funds to their welfare department for use with welfare recipients encountering emergency home repair situations. For information, check with your county welfare office.
- **Conventional Home Improvement Loans**—available through banks and savings and loan associations; although terms vary substantially, they are similar to a maximum of $25,000 at 12% interest for 12 years.
- **Credit Union Home Improvement Loans**—available to members of credit unions for a maximum of $15,000 at 9 to 12% interest for 5 to 15 years.
- **Finance Company Installment Loans**—available through "industrial and thrift finance companies" at 18½ to 22% interest for 5 years, or "small loan companies" for a maximum of $1,200 at 22 to 36% interest for 3 years.
- **Dealer Installment Loans**—available through remodeling contractors and material and equipment suppliers; interest rates and other terms are generally unregulated—Note: BEWARE!
- **Life Insurance Loans**—available to individuals with "whole-life" policies; amount varies according to the paid value of the policy and interest rate specified in the policy, terms (years) unlimited although benefits to the insured's beneficiary are reduced by loan amount; for information, review life insurance policy and contact agent.
- **(Re)Finance Mortgage**—if improvements are substantial, individual may wish to obtain a (new) mortgage to cover the costs of improvement; available through bank or savings and loan association; terms vary according to type of financing—interest rates from 8½% (VA, January 1, 1978) to 9% (FHA, Conventional, January, 1978) for maximum of 30 years.

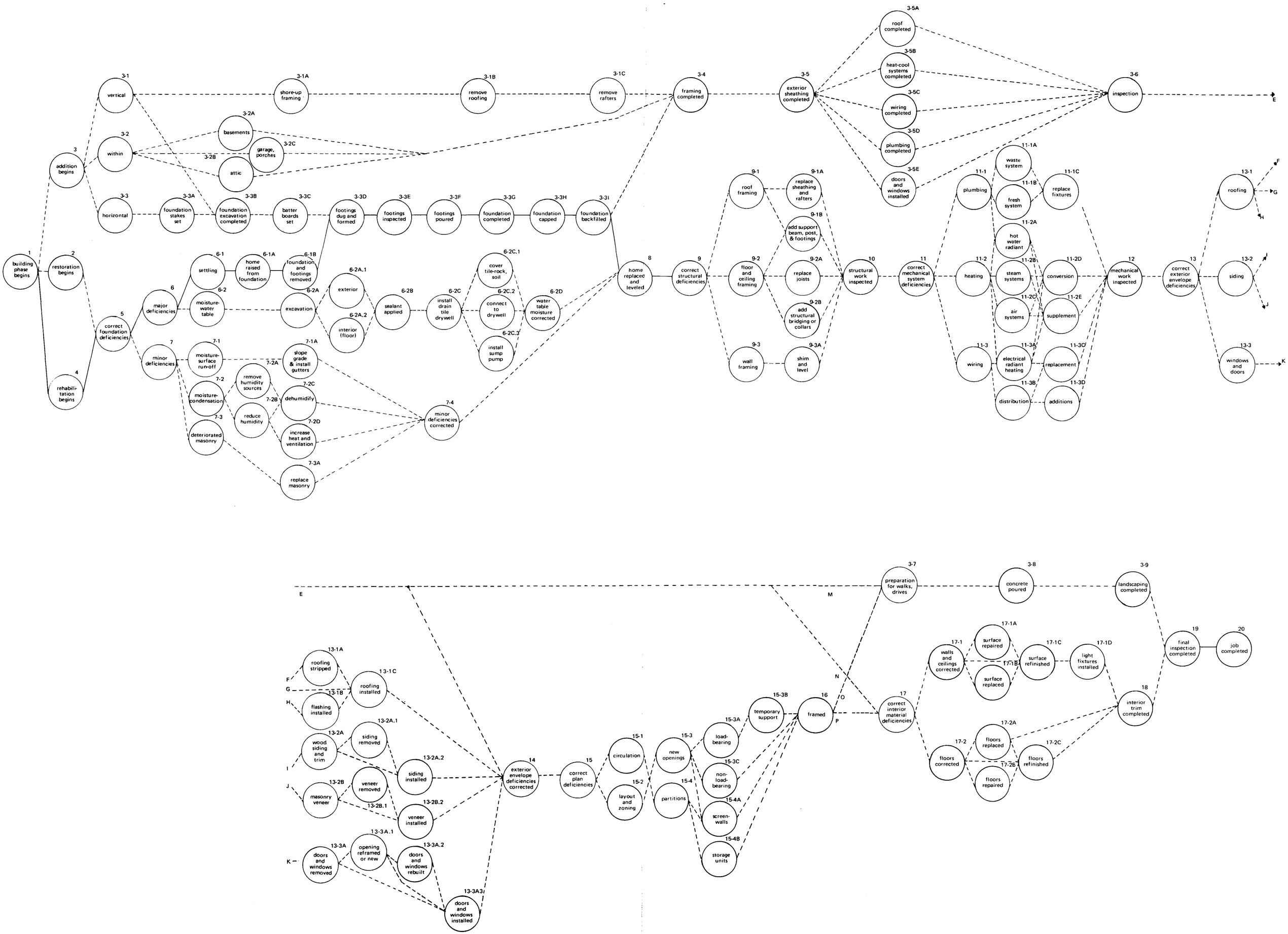
EFFECTS OF REMODELING ON PROPERTY TAXES

Remodelers frequently wonder to what degree their property taxes will be affected by their desired improvements. Although it is difficult to determine the precise impact ahead of time, you may wish to contact the local assessor's office and request an estimate

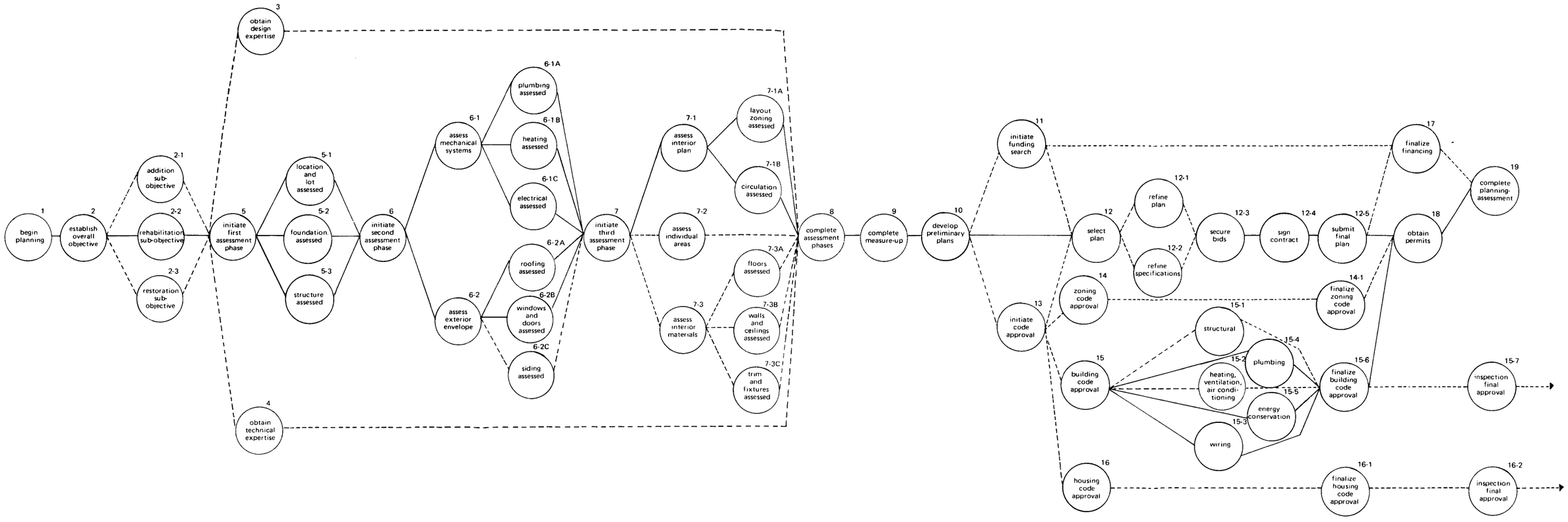
Table 6. General effect of common home improvements on property taxes

Assessed value increased if:	*Assessed value not increased if:*[1]
Add a room	Reroofing or replacing gutters
Add or expand garage	Replacing or repairing exterior siding
Finish a basement	Repairing foundation or structure
Finish an attic	Reinsulating or weatherstripping
Enclose or add a porch	Adding electrical circuits
Install a bathroom	Installing lighting fixtures
Rehabilitating kitchen	Installing plumbing fixtures
Rehabilitating bathroom	Replacing furnace or water heater
Rehabilitating any existing area	Landscaping or adding fence

[1]When these improvements are taken **individually**, they generally will not increase assessed value.


1 building phase begins
2 restoration begins
3 addition begins
4 rehabilitation begins
5 correct foundation deficiencies
6 major deficiencies
7 minor deficiencies
3-1 vertical
3-1A shore-up framing
3-1B remove roofing
3-1C remove rafters
3-2 within
3-2A basements
3-2B attic
3-2C garage, porches
3-3 horizontal
3-3A foundation stakes set
3-3B foundation excavation completed
3-3C batter boards set
3-3D footings dug and formed
3-3E footings inspected
3-3F footings poured
3-3G foundation completed
3-3H foundation capped
3-3I foundation backfilled
3-4 framing completed
3-5 exterior sheathing completed
3-5A roof completed
3-5B heat-cool systems completed
3-5C wiring completed
3-5D plumbing completed
3-5E doors and windows installed
3-6 inspection
E
6-1 settling
6-1A home raised from foundation
6-1B foundation and footings removed
6-2 moisture-water table
6-2A excavation
6-2A.1 exterior
6-2A.2 interior (floor)
6-2B sealant applied
6-2C install drain tile drywell
6-2C.1 cover tile-rock, soil
6-2C.2 connect to drywell
6-2C.3 install sump pump
6-2D water table moisture corrected
7-1 moisture-surface run-off
7-1A slope grade & install gutters
7-2 moisture-condensation
7-2A remove humidity sources
7-2B reduce humidity
7-2C dehumidify
7-2D increase heat and ventilation
7-3 deteriorated masonry
7-3A replace masonry
7-4 minor deficiencies corrected
8 home replaced and leveled
9 correct structural deficiencies
9-1 roof framing
9-1A replace sheathing and rafters
9-1B add support beam, post, & footings
9-2 floor and ceiling framing
9-2A replace joists
9-2B add structural bridging or collars
9-3 wall framing
9-3A shim and level
10 structural work inspected
11 correct mechanical system deficiencies
11-1 plumbing
11-1A waste system
11-1B fresh system
11-1C replace fixtures
11-2 heating
11-2A hot water radiant
11-2B steam systems
11-2C air systems
11-2D conversion
11-2E supplement
11-3 wiring
11-3A electrical radiant heating
11-3B distribution
11-3C replacement
11-3D additions
12 mechanical work inspected
13 correct exterior envelope deficiencies
13-1 roofing
13-2 siding
13-3 windows and doors
F
G
H
I
J
K

E
M
N
O
P
3-7 preparation for walks, drives
3-8 concrete poured
3-9 landscaping completed
19 final inspection completed
20 job completed
13-1A roofing stripped
13-1B flashing installed
13-1C roofing installed
13-2A wood siding and trim
13-2A.1 siding removed
13-2A.2 siding installed
13-2B masonry veneer
13-2B.1 veneer removed
13-2B.2 veneer installed
13-3A doors and windows removed
13-3A.1 opening reframed or new
13-3A.2 doors and windows rebuilt
13-3A3 doors and windows installed
14 exterior envelope deficiencies corrected
15 correct plan deficiencies
15-1 circulation
15-2 layout and zoning
15-3 new openings
15-4 partitions
15-3A load-bearing
15-3B temporary support
15-3C non-load-bearing
15-4A screen-walls
15-4B storage units
16 framed
17 correct interior material deficiencies
17-1 walls and ceilings corrected
17-1A surface repaired
17-1B surface replaced
17-1C surface refinished
17-1D light fixtures installed
17-2 floors corrected
17-2A floors replaced
17-2B floors repaired
17-2C floors refinished
18 interior trim completed



EXPLANATION: REMODELING ASSESSMENT—PLANNING PHASE

1. **BEGIN PLANNING:** Consider basic needs, resources, and priorities, general feasibility of remodeling, and alternatives to remodeling.
2. **ESTABLISH OVERALL OBJECTIVE:** Tentatively decide to remodel within an approximate time and budgetary frame. The remodeling decision may involve: building an addition or rehabilitating or restoring the dwelling.
   - 2-1 *ADDITION SUB-OBJECTIVE:* You may choose to add more space to the interior or exterior of the dwelling.
   - 2-2 *REHABILITATION SUB-OBJECTIVE:* You may choose to improve existing space and facilities within the dwelling.
   - 2-3 *RESTORATION SUB-OBJECTIVE:* You may choose to restore historically and architecturally features of the dwelling to their original state.
3. **OBTAIN DESIGN EXPERTISE:** You may seek design and planning assistance from professional architects, historians, material suppliers, or other sources.
4. **OBTAIN TECHNICAL EXPERTISE:** You may seek on-site technical assistance from professional engineers, local building inspectors, or other sources for assessing structural and mechanical components.
5. **INITIATE FIRST ASSESSMENT PHASE:** If proceeding without design and technical assistance, begin assessing the dwelling for critical (costly) deficiencies.
   - 5-1 *LOCATION AND LOT ASSESSED:* Desirability of location and lot considered including-proximity to work, schools, etc.; neighborhood property values and characteristics; physical topographical features; landscaping; etc.
   - 5-2 *FOUNDATION ASSESSED:* Structural integrity of foundation and susceptibility to moisture seepage are assessed.
   - 5-3 *STRUCTURE ASSESSED:* Floor, wall, ceiling, and roof structural members assessed for ability to carry existing or additional (weight) loads.
6. **INITIATE SECOND ASSESSMENT PHASE:** Assess the dwelling for significant (not necessarily critical) and costly deficiencies.
   - 6-1 *ASSESS MECHANICAL SYSTEMS:* The three basic mechanical systems, plumbing, heating, and electrical, are evaluated for possible replacement, repair, or capacity expansion.
     - 6-1A PLUMBING ASSESSED: Fresh water and drainage lines, vents, traps, and fixtures are evaluated.
     - 6-1B HEATING ASSESSED: Heating plant, distribution lines, heating elements, and controls as well as insulation are evaluated.
     - 6-1C ELECTRICAL ASSESSED: Basic capacity of service and branch circuits, condition of wiring, and outlet, switch, and lighting quality are evaluated.
   - 6-2 *ASSESS EXTERIOR ENVELOPE:* The three basic exterior elements, roofing, window-doors, and siding are evaluated for possible repair or replacement.
     - 6-2A ROOFING ASSESSED: Roofing material, flashing, and roof-deck ventilation (if inadequate, ice-damming often results) are evaluated.
     - 6-2B WINDOWS AND DOORS ASSESSED: Caulking, weather-stripping, and condition of windows and doors are evaluated.
     - 6-2C SIDING ASSESSED: Siding is evaluated for deterioration caused by exterior or interior moisture, either of which must be resolved before satisfactory repair or replacement can occur.
7. **INITIATE THIRD ASSESSMENT PHASE:** Assess dwelling for interior features which may limit livability.
   - 7-1 *ASSESS INTERIOR PLAN:* The two critical elements influencing the functioning of the plan, circulation, and layout-zoning, are evaluated.
     - 7-1A LAYOUT-ZONING ASSESSED: Separation and concentration of space into three basic areas (public, private, and service) is evaluated in terms of family living patterns and activities (social, personal, and work).
     - 7-1B CIRCULATION ASSESSED: Direct and short traffic patterns are indicators of a good plan; therefore, the dwelling is evaluated for these features.
   - 7-2 *ASSESS INDIVIDUAL AREAS:* Areas are assessed for their adequacy to efficiently support specialized activities (e.g. kitchen-food storage, preparation, serving, etc.).
   - 7-3 *ASSESS INTERIOR MATERIALS:* The three major interior finish materials, floors, walls-ceilings, and trim fixtures, are evaluated.
     - 7-3A FLOORS ASSESSED: Floor surfaces are evaluated for unevenness, worn areas, ease of maintenance, and safety as well as aesthetical value.
     - 7-3B WALLS AND CEILINGS ASSESSED: Wall and ceiling surfaces are evaluated for cracks, holes, loose areas, and ease of maintenance as well as aesthetical value.
     - 7-3C TRIM AND FIXTURES ASSESSED: Trim and electrical and plumbing fixtures are evaluated for general functional condition and aesthetical value.
8. **COMPLETE ASSESSMENT PHASES:** Review deficiencies, establish priorities, and obtain a preliminary estimate of costs.
9. **COMPLETE MEASURE-UP:** Accurately measure the existing dwelling (including window and door openings and wall placements) and draw a scaled floor plan with all dimensions noted.
10. **DEVELOP PRELIMINARY PLANS:** Test alternative space arrangements and circulation patterns. (perhaps using transparent overlays on existing scaled plan)
11. **INITIATE FUNDING SEARCH:** Evaluate alternative "home improvement" financing from local lenders in terms of availability, amount, interest rate, term, and so on.
12. **SELECT PLAN:** Select the plan which best fits your objectives, the condition of the dwelling, the availability of financing, and code requirements.
    - 12-1 *REFINE PLAN:* Complete any last-minute changes in the floor plan.
    - 12-2 *REFINE SPECIFICATIONS:* Complete material lists and finalize specifications.
    - 12-3 *SECURE BIDS:* You may ask several remodeling contractors, or several groups of tradespeople and material suppliers, to submit estimates (bids) of work.
    - 12-4 *SIGN CONTRACT:* Based upon bids and investigations into the experience and reputation of the contractors or subcontractors-material suppliers, make your selection and sign a contract (wth legal counsel if desired).
    - 12-5 *SUBMIT FINAL PLAN:* Submit final plan to obtain financing and code approval.
13. **INITIATE CODE APPROVAL:** Depending upon local regulations, you must submit plans and specifications for local zoning and state building codes and perhaps seek compliance with the local housing code.
14. **ZONING CODE APPROVAL:** If planning exterior additions, you likely must seek approval of the local zoning official.
    - 14-1 *FINALIZE ZONING CODE APPROVAL:* Any variations with local zoning code requirements are corrected and approval is obtained.
15. **BUILDING CODE APPROVAL:** You will likely seek a building permit from your local inspector.
    - 15-1 *STRUCTURAL:* If the local unit of government has adopted the state building code, structural changes must be approved.
    - 15-2 *(HVAC) HEATING, VENTILATION, AIR CONDITIONING:* If the local unit of government has adopted the state building code, HVAC changes must be approved.
    - 15-3 *WIRING:* Any electrical wiring changes must be approved.
    - 15-4 *PLUMBING:* Any plumbing changes must be aproved.
    - 15-5 *ENERGY CONSERVATION:* All remodeling plans must be in compliance with the minimum requirements of the state's energy conservation requirements.
    - 15-6 *FINALIZE BUILDING CODE APPROVAL:* Any variations with state building code requirements are corrected and approval is obtained.
    - 15-7 *INSPECTION FINAL APPROVAL (BUILDING CODE):* With completion of construction, building code approval is made if final inspection indicates compliance.
16. **HOUSING CODE APPROVAL:** You may desire or be required, depending on financing, to meet local housing code requirements.
    - 16-1 *FINALIZE HOUSING CODE APPROVAL:* Any violations of local housing code regulations are noted for correction during construction.
    - 16-2 *INSPECTION FINAL APPROVAL (HOUSING CODE):* With completion of construction, housing code approval is made if final inspection indicates compliance.
17. **FINALIZE FINANCING:** Finalize financing arrangements and you may be required to submit final plans and specifications if major changes are involved.
18. **OBTAIN PERMITS:** Building and zoning permits are issued.
19. **COMPLETE PLANNING-ASSESSMENT.**

of the increase in assessed value and approximate increase in property tax resulting from the improvements. As a general rule, certain types of improvements will have no effect on the property tax situation (see table 6).

If the home's assessed value has increased after remodeling, and if you believe that the increase is not justified, you can contact the assessor's office to learn the procedure for appealing the assessment. Before appealing, however, recognize that the review board (generally members of the city council or county board of commissioners) can recommend that the assessed value be increased if they think it is low.

MONTHLY COSTS

When considering sources and types of financing, it is critical that you the *borrower* (not the lender) assess what can be comfortably afforded. Rules of thumb (e.g., no more than 25 percent of gross income for housing) are helpful as guidelines but are misleading for all but the hypothetical "average" consumer. A better method to determine how much can be afforded each month is the "comparative expenditure method" shown in table 7.

To estimate future costs for:

- **Principal and Interest.** Check with a lender and ask what the monthly costs of the improvement loan will be in addition to existing mortgage payments.
- **Property Taxes.** As outlined on page 11, contact the local assessor to derive an estimate of the effect of the improvement upon property taxes.
- **Property Insurance.** Contact an insurance agent and describe the improvements in order to derive an estimate of additional insurance costs.

Table 7. Determining "comfort-level" of monthly costs

EXPENDITURE TYPE	*Average monthly costs* — *Current expenditure*	*Estimated expenditure*
Mortgage principal and interest	$_____	$_____
Home improvement loan (proposed)	XXXXXXX	_____
Property taxes	_____	_____
Property insurance	_____	_____
Utilities	_____	_____
Maintenance-repair	_____	_____
Other (e.g., credit life insurance for loan, etc.)	_____	_____
Total	$_____	$_____

- Are the estimated monthly costs after improvement realistic?

INCOME (stable, secure, dependable) SITUATION	*Monthly income*
Head of household's gross income	$_____
Spouse's gross income	_____
Other household gross income	_____
Total	$_____

- How secure is this income situation?
- To what degree is this income situation likely to increase? . . . to decrease?

DEBT SITUATION	*Monthly amount*
Amount of debt pay-back (over 10 months remaining) (including existing mortgage and installment payments)	$_____
Additional debt pay-back anticipated	_____
Total	$_____

- Does the total appear reasonable (maximum averages 30 to 40 percent of gross income)?

FUTURE EXPENDITURES

- Do you have anticipated educational expenses that should be considered?
- Do you need a vacation for which expenses should be considered?
- Do you have deferred medical or dental expenses that should be considered?
- Do you have any other expenditures that should be considered?
- **Remember: If a home improvement does not contribute to the quality of life you desire, it's not worth it.**

Table 8. Major types of remodeling costs and approximate potential savings

Type of expenditure	Potential do-it-yourself savings	Approximate savings by type of remodeling					
		Rehabilitation		Exterior addition		Interior addition	
		Percent	$10,000 Job	Percent	$10,000 Job	Percent	$10,000 Job
Labor	ALL	50	5,000	30	3,000	35	3,500
Materials and equipment	1/20[1]	30	150	50	250	45	225
Overhead and profit	ALL	15	1,500	15	1,500	15	1,500
Miscellaneous	1/2[1]	5	250	5	250	5	250
Total potential savings		69	$6,900	50	$5,000	55	$5,475

[1]The estimated potential savings of 1/20 for materials and equipment reflect the savings the do-it-yourselfer may average if he or she can obtain a discount on materials. The possible discount is higher for some materials, such as light fixtures and kitchen cabinets, than for others, such as lumber. The estimate of potentially saving 50 percent for "miscellaneous" reflects possible savings by avoiding the contractor's costs for items such as advertising.

- **Utilities.** Contact local utility company and describe the improvement in order to derive an estimate of additional utility costs.
- **Maintenance and Repair.** If rehabilitating, estimate the maintenance budget at 1 percent per year of the market-value of the home after improvement for maintenance repair (10-year average). If adding space, allow an additional 1 percent of the cost of the addition annually for maintenance repair (10-year average). NOTE: The average expenditure for maintenance-repair, including equipment replacement, has averaged annually about 1½ percent of the value for homes of 15 years of age or less and 2½ percent for homes over 15 years of age.

Construction Considerations

After obtaining a complete set of plans and specifications and necessary financing, the next major step involves getting the work underway. You are now faced with the questions, "How much work should I do myself? If I decide to work through a contractor, how can I obtain the best service at a reasonable cost?" These questions reflect important alternatives you should weigh.

COMPLETELY DOING THE WORK YOURSELF

As noted earlier in table 2, about half of remodeling efforts are entirely completed on a do-it-yourself basis. This trend appears to be most common when the project involves rehabilitating or finishing off existing space. Since remodeling is frequently "labor-intensive," you may be able to substantially reduce costs by doing work yourself.

As illustrated in table 8, the potential for savings will vary according to the type of remodeling project and the individual remodeler's skills, experience, access to tools, selection of materials, ability to obtain material discount, etc. Your actual savings will decrease if you over-estimate or misuse materials.

If planning to proceed on a do-it-yourself basis, recognize that you will be earning rather than saving money. Because of this, the potential do-it-yourselfer must:

- carefully assess the time needed to do the work. Usually, it takes the do-it-yourselfer 50 to 100 percent longer to complete the same amount of work as a tradesperson; and this investment of the do-it-yourselfer's time is after a day or week of normal work.
- carefully assess the skill, experience, or willingness to learn how to do the job well. Whereas most people can adequately perform labor, jobs such as wiring and plumbing are more challenging and can be extremely dangerous if attempted without experience, knowledge, or professional help.
- realize that lenders are less anxious to make a construction loan to a do-it-yourselfer unless he or she has experience.

FUNCTIONING AS A GENERAL CONTRACTOR

As noted earlier in table 2, about a quarter of remodeling efforts are completed on a partial do-it-yourself basis with the homeowner functioning as a general contractor. In this situation, the homeowner does some work and then contracts other jobs to tradespeople. In addition to actually doing a portion of the work on a do-it-yourself basis, the homeowner assumes responsibility for hiring, paying, and scheduling subcontractors as well as scheduling material deliveries and inspections. Consequently it becomes imperative that the do-it-yourself general contractor:

- have a *complete* set of working plans and *detailed* specifications.
- have a working knowledge of the time it takes to complete each job in order to efficiently schedule subcontractors, material deliveries, and inspections.
- carefully selects reputable subcontractors and insures each is licensed, bonded, and insured

when required by state codes (plumbing, electrical).

- has a complete written contract, reviewed by the owner's attorney, which specifies that *subcontractors will:* complete the work according to the plan, specifications, and applicable codes; furnish lien-waivers prior to payment; receive a specified payment for work after the owner's inspection; and obtain necessary permits (if plumbing, electrical, or heating) in the subcontractor's own name.
- realizes that it may be more difficult to get subcontractors for small jobs, especially when other construction jobs are plentiful.

Recognizing this situation, if you are functioning as a general contractor you must also decide which work you wish to handle on a do-it-yourself basis. In addition to the time, skill, and experience considerations previously noted, you may wish to weigh the costs of labor needed to do various types of jobs. The average hourly earnings of union and non-union construction workers are presented in table 9.

Table 9. Prevailing hourly rates and fringe benefit payments of Minnesota residential construction workers (April–July, 1977)

Trade	Rate-Benefit Low	Rate-Benefit High	Notes
Block and bricklayer	$10.95	$11.76	These figures have been derived from data collected from 18 Minnesota counties by the U.S. Department of Labor under the Davis-Bacon Act of 1931 and published in the Federal Register from April 1–July 8, 1977. The combined rates and benefits listed represent the amount paid to the majority of workers in the particular trade. Consumers should expect these amounts to vary; generally lowest in rural areas when unskilled and/or non-union trades are involved and generally highest in rural areas when skilled, union trades are brought in by a general contractor.
Carpenter	7.62	11.02	
Cement mason	10.05	11.33	
Electrician	7.63	13.37	
Laborer	7.70	10.23	
Painter	6.90	10.71	
Plaster	8.65	11.10	
Plumber	9.93	12.30	
Roofer	9.39	11.38	
Tile setter	10.25	11.12	

HIRING A CONTRACTOR

The easiest, but most expensive, way to complete remodeling is to hire a general contractor. About one-fifth of all remodeling jobs are turned over to general contractors. In this situation, several items must be considered including types of contractors; how to select a contractor; the importance of contracts; and methods of payment.

Types of Contractors. There are three basic types of contractors you may wish to choose to work with depending on the type of improvement desired:

- General contractor who builds new homes as well as does remodeling and assumes responsibility for ordering and scheduling materials; hiring, coordinating, and paying subcontractors; and inspecting work.
- Remodeling contractor who does only remodeling work but otherwise performs the same service as a general contractor.
- Speciality contractor, such as a masonry, electrical, painting, or plumbing contractor, who does only specialized work restricted to one type of building trade. You would work directly with such an individual if the desired improvement were restricted to that type of work.

Selecting a Contractor. There are ten basic considerations in selecting a contractor:

- Recommendations—Talk with friends, neighbors, business associates, and others who have remodeled and ask about their contractors' work, performance, and charges. Remember, a contractor seldom refers anyone to dissatisfied customers if asked for references.
- Reputation—Check with your mortgage officer, Better Business Bureau, local housing authority, material suppliers, and, perhaps, local building, HVAC, electrical, or plumbing inspectors.
- Experience—A contractor who has been in business for a number of years will more likely be accessible in the future if problems arise.
- Financial security—A contractor who has a good credit record (check with local bank or credit bureau) is most likely to be able to complete the job and to pay subcontractors and material suppliers who may place a lien on the home if not paid.
- Relations with subcontractors—Subcontractors and their state trade associations can tell you (usually in a guarded fashion) about contractor's performance.
- Membership in the National Association of Home Builders, the National Home Improvement Council, or other trade association indicates the contractor's interest in improving the ethical practices and standards of his or her profession.
- Licensed and bonded—Certain types of contractors, such as plumbing and electrical contractors, must be licensed and bonded according to state law. In addition some municipalities, such as Minneapolis, require that remodeling contractors be licensed.
- Established—A contractor with an established office in the community rather than an answering service or post office box address is likely to be available to correct any problems after he or she is paid.

- Carries workman's compensation and liability insurance—Only contractors who carry, and are willing to provide evidence that they carry, adequate insurance should be considered.
- Bids—Asking a contractor to provide a written bid is important; however it should not be requested until the contractor has been checked according to the above items. Request no more than three bids and tell the contractors this fact. Feeling that he or she has a good chance of getting the job, each contractor will give his or her best and most accurate bid. Remember each contractor should have a complete, identical set of plans and specifications. Choose the contractor based upon the track record, the interest in you and the job as well as the reasonable bid. Sometimes the lowest bid will not be the best, especially if the contractor has substituted materials of lesser quality in the itemized bid, has simply left out items, or has included items as extras.

CONTRACTS

All business relationships legally exist with a contract (whether oral or written) which specifies such items as work to be performed, materials to be used, standards of performance, and methods and amounts of payment. Although oral contracts are usually legally binding, they are subject to misunderstanding and are difficult to enforce when disputes arise. **All contracts therefore should be in writing**[4] and should state clearly:

- that the work will be done according to the plan and specifications and will meet or exceed all applicable codes.
- that any changes in the work or variations from the plans and specifications, whether made by the contractor or owner, shall be undertaken only after a written change order is signed by both individuals. Any costs or credits resulting from the change shall be included in the change order.
- the date at which work will begin and be completed. (NOTE: Be reasonable. Remodeling often involves many unknowns which may affect completion. If completion date is critical, include—and be willing to pay extra for—a penalty clause.)
- that the contractor will obtain all necessary building, electrical, plumbing, and HVAC permits. (NOTE: This legally obligates the contractor to perform and complete work in accordance with applicable codes.)
- that the contractor shall maintain a performance bond and a payment bond sufficient to protect the owner (this guarantees work will be completed and all proper claims will be paid; especially important if lump sum method of payment is used).
- that the contractor will furnish lien-waivers from all subcontractors and material suppliers (required by Minnesota Statutes) prior to payment by the owner.
- that the contractor will maintain adequate liability insurance sufficient to protect the owner (includes workman's compensation, personal injury, property damage insurance) while the owner will maintain fire, extended coverage, and vandalism insurance.
- any oral promises or guarantees which are to be included.
- other provisions that may be desirable including: cleanup, debris removal, protection of landscaping and other property, etc.

Generally the contractor will prepare the contract, in which case it should be carefully reviewed by your attorney if there are even minor questions and whenever costs are substantial. If the contractor does not prepare a contract, you should request your attorney to do so.

METHODS AND SCHEDULES OF PAYMENT

There are several methods and schedules of paying the contractor which should be specified in the written contract.

Lump-Sum Method. This is the most common method of payment. It involves the agreement to pay the contractor a set fee for the project plus any additional amount resulting from extras due to changes or omissions.

Cost-Plus Method. This method does not limit costs and involves the agreement to pay the contractor the actual costs of materials and labor plus a fixed fee or fixed percentage of these costs (usually 10 to 20 percent).

Maximum Total Method. This method of payment involves a maximum payment to the contractor for the project and may include a schedule for dividing material and labor savings, if any, between contractor and owner.

Partial Payment Schedule. Any of the three methods of payment may be scheduled according to the amount of work completed or materials delivered. This schedule is the most common and frequently operates as follows: 20 percent upon "capping" of foundation; 20 percent upon completion of framing and roofing; 20 percent upon completion of wiring, plumbing, and heating; and 20 percent upon final inspection and owner's acceptance.

[4]The importance of a written contract cannot be overemphasized. Remodeling is a major source of consumer complaints as well as a complex and financially important undertaking. The relationship with contractors should therefore be businesslike—in writing.

On Completion Payment Schedule. Any of the three methods of payment may be scheduled to be paid upon completion of the project. This schedule is more common for less expensive remodeling projects.

TERMINATION OF CONTRACT UNDER MINNESOTA STATUTES

As a consumer you have the right (unless it is waived in writing) to cancel a contract involving charges over $100. To exercise this right, you must send a written notice to the contractor within 3 days of signing the contract. After this period the contract may be canceled only in the following situations:

- by the owner giving written notice to the contractor *if* the contractor fails to perform any work specified in the contract or according to the plans and specifications.
- by the contractor *if* the owner fails to pay for services rendered in accordance with the contract or if the owner or other party delays the work called for in the contract.

If considering canceling a contract, you should contact your attorney promptly and proceed under the attorney's guidance.

Permit Considerations

Before any remodeling construction begins, you should check to see what, if any, permit requirements exist in your community. These requirements relate to construction and land-use regulations such as the following:

Zoning Codes. Establish local land-use guidelines, define areas where homes may be converted to multi-family use, and establish height and set-back requirements.

Well-Drilling Code. Establishes state-wide guidelines for installing a private well.

Septic Tank Code. Establishes state-wide guidelines for installing a private sewage treatment system.

State Building Code. Includes the following provisions:

- Uniform Building Code (UBC)—enforced at the option of the community or county; establishes uniform structural standards for new construction.
- National Electrical Code (NEC)—enforced state-wide; establishes standards for new wiring.
- Minnesota Plumbing Code—enforced in communities with populations over 5000 or whenever a home is connected to public water mains; establishes standards for new plumbing.
- Minnesota Mechanical Code—enforced at the option of the community or county; establishes standards for new heating, ventilation, and air conditioning (HVAC) systems.
- Energy Conservation Regulations—enforced state-wide; establishes energy conservation standards for additions and substantial rehabilitation and restoration work.

Housing Codes. Establish local maintenance guidelines.

These codes, for the most part, establish *minimum* health and safety standards as well as reflect well-accepted construction standards. When you remodel, you will want to meet or exceed code requirements. Do not be so short-sighted, and/or careless with your family's health and safety, as to side-step the permit and code procedures.

To obtain a permit, submit the plans and specifications to the local building and/or zoning official. Following a safety check, a permit will be issued. Then, as construction progresses, the inspector(s) will examine construction to insure that the work meets or exceeds code requirements.

Sources of Remodeling Assistance

There are a variety of sources available to help answer questions and to provide helpful information on remodeling. These sources include:

Local Public Libraries. The community library is probably your single best source of unbiased information about remodeling planning and construction. Even in smaller communities, interlibrary loan brings a wealth of information to the consumer. You should recognize that many library references will be dated or otherwise not applicable to Minnesota's climatic and code requirements. Therefore, it is important to be selective and thorough in your library search. Remember not to overlook recent issues of popular home improvement magazines and U.S. Government Printing Office publications.

County Extension Service. Funded in part by the University of Minnesota, this unit of county government provides many relevant consumer-oriented references and non-credit short courses on home improvements. Stop in the county extension office and ask:

- for free copies of home improvement publications to meet specific needs.
- to review the Housing Handbook, a collection of more than 220 popular consumer housing references.
- to review the county's listing of 2500 consumer housing references available free or at a modest cost from over 400 organizations.
- what short courses and workshops are available on home improvement.

Community Design Center (CDC). Low- and moderate-income families may wish to seek design assistance from CDC, 118 East 26 Street, Minneapolis, MN

55404. CDC also maintains an extensive home improvement and do-it-yourself library.

Local Housing and Redevelopment Authorities (LHRA). LHRA's, especially in larger communities, have services available to owners desiring to remodel, including: information about loans and grants; lists of approved remodeling contractors; free inspection and planning services in target neighborhoods; etc.

Vocational Technical Schools. If you desire to do your own wiring, plumbing, or other remodeling work, courses offered by area VO-TECH schools offer an excellent opportunity to perfect important skills.

Material Suppliers. Many retail material suppliers, such as lumberyards and plumbing fixture outlets, offer relevant workshops, do-it-yourself publications, and individual consultation.

Historical Societies. Both the Minnesota and county historical societies can help you research the architectural history of your home and refer you to other sources of information especially helpful in restoration.

Neighborhood Organizations. In many communities, residents have organized to help each other in the maintenance and upgrading of entire neighborhoods. In fact, some of the most effective rehabilitation efforts have grown through neighborhood organizations: lobbying for improved municipal services; obtaining material and labor discounts for work contracted for several homes at the same time; etc.

Trade Associations. Although biased by their desire to promote their own trades, associations can provide information about their products as well as members providing specific types of service. Examples of trade associations include: (addresses found in Minneapolis and St. Paul phone directories)

- HBA—Home Builders Association in larger communities can provide information about remodeling contractors.
- MAPHCC—Minnesota Association of Plumbing, Heating, and Cooling Contractors can provide information about members doing plumbing and hot water and steam radiant heating work.
- MACMC—Minnesota Association of Concrete and Masonry Contractors can provide information about masonry contractors.
- MEA—Minnesota Electrical Association can provide information about electrical contractors and suppliers.
- MMI—Minnesota Masonry Institute can provide information about concrete, block, brick, and stone suppliers and masonry contractors.
- MSA—Minnesota Society of Architects can provide a list of architects doing specialized remodeling design work.
- SMARCA—Sheet Metal, Air Conditioning, and Roofing Contractors Association can provide a list of members specializing in forced-air heating systems.

Utility Suppliers. Most electrical and fuel suppliers are anxious to provide information about energy conservation questions such as those involving insulation, storm windows, weatherstripping, and so on.

The following information describes the diagram of the Remodeling Construction Phase in the enclosed foldout.

EXPLANATION: REMODELING CONSTRUCTION PHASE

1. **BUILDING PHASE BEGINS:** Review construction methods and scheduling with others involved (spouse, contractor, subcontractors, etc.)
2. **RESTORATION BEGINS:** If dwelling restoration is desired, proceed similar rehabilitation.
3. **ADDITION BEGINS:** If adding space within or to the exterior of the dwelling, be certain that existing deficiencies are also corrected through rehabilitation (e.g. basement moisture problems corrected before basement finished).
   - 3-1 *VERTICAL:* In most single story houses, an addition of a second floor is possible. Although expensive, houses on slab and crawl-space foundations may also be raised and a basement excavated below.
     - 3-1A SHORE-UP FRAMING: Framing, especially first floor ceiling joists and door and window headers, may need to be strengthened prior to addition of second floor.
     - 3-1B REMOVE ROOFING: Single and sheathing are removed. (Note: Home is susceptible to rain damage at this point.)
     - 3-1C REMOVE RAFTERS: Roof rafters are removed.
   - 3-2 *WITHIN:* Unfinished space may be converted into living areas.
     - 3-2A BASEMENTS: The most popular method of creating additional useable interior space is by finishing the basement.
     - 3-2B ATTIC: Unfinished attics offer another opportunity to gain useable space.
     - 3-2C GARAGE, PORCHES: Attached porches in pre-1930 houses and attached garages in post-1940 houses are often turned into living space.
   - 3-3 *HORIZONTAL:* If local zoning ordinances permit, yard space may be used for an addition.
     - 3-3A FOUNDATION STAKES SET: Position of addition in relation to dwelling and site is marked by stakes. Tree removal or protection and identification of areas where removed earth can be piled are also considered.
     - 3-3B FOUNDATION EXCAVATION COMPLETED: Depth of excavation is verified to insure footings are below frost line or additional basement will have adequate headroom.
     - 3-3C BATTER BOARDS SET: Batter boards are set and checked by using diagonal measurements to insure addition is square.
     - 3-3D FOOTINGS DUG AND FORMED: Height and level of footings as well as firmness of soil should be checked.

3-3E FOOTINGS INSPECTED: Approval by local building inspector may be necessary before concrete is poured.

3-3F FOOTINGS POURED: Proper concrete mixture as required by local soil and load conditions should be insured.

3-3G FOUNDATION COMPLETED: Foundation is completed after walls have been laid (block) or poured (concrete) and inspected for squareness and levelness. In high water table areas, drainage tile would be installed and basement wall sealant applied at this time.

3-3H FOUNDATION CAPPED: Sill plates, floor joists, and subfloor are installed.

3-3I FOUNDATION BACKFILLED: Backfilling requires compacting every 1 to 2 feet to guard against uneven settling.

3-4 *FRAMING COMPLETED:* Exterior and interior framing walls, roof trusses, ceiling joists, and stairways are constructed.

3-5 *EXTERIOR SHEATHING COMPLETED:* Plywood or insulation board is installed on exterior walls and roof. Adequate fastening of this material should be checked.

3-5A ROOF COMPLETED: Underlayment, shingles, and any necessary sheet metal for flashing or gutters are added.

3-5B HEATING AND COOLING SYSTEMS COMPLETED: Ductwork, chimney flues, and new heating/cooling plant, if any, are installed. Proper routing of ductwork for clearances should be checked.

3-5C ELECTRICAL AND PHONE WIRING COMPLETED: Proper positioning of outlets and fixtures, including thermostats and doorbells, should be checked.

3-5D PLUMBING COMPLETED: All water, drainage, and vent lines are installed. Proper preparations for inspection must be made.

3-5E DOORS AND WINDOWS INSTALLED: Windows and doors should be checked for proper operation and fastening.

3-6 *FRAMING, PLUMBING, WIRING, AND ROOFING INSPECTION:* Do-it-yourselfer should review these areas with the inspector prior to doing such work himself. This often-failed inspection is the most important one made by the local building official.

3-7 *PREPARATION FOR CONCRETE SLABS, WALKS, AND DRIVES:* Do-it-yourselfer should check for proper depth and adequate reinforcing.

3-8 *CONCRETE POURED:* Do-it-yourselfer should be sure the desired finish has been obtained on the concrete and the pitch of the slab is correct.

3-9 *LANDSCAPING COMPLETED:* All site work and plantings are finished. Do-it-yourselfer should check for proper drainage before any planting is done.

4. **REHABILITATION BEGINS:** Correct the most serious deficiencies first.

5. **CORRECT FOUNDATION DEFICIENCIES:** The most serious deficiency, is one that affects the structural or moisture resistant qualities of the foundation.

6. **MAJOR DEFICIENCIES:** Immediate attention should be given to foundation settling and substantial water seepage.

6-1 *SETTLING:* Substantial settling generally requires complete rebuilding of footings and foundation walls.

6-1A HOME RAISED FROM FOUNDATION: To rebuild a foundation, the house must be raised from the foundation, generally by a professional.

6-1B FOUNDATION AND FOOTINGS REMOVED: Deteriorated footings and foundation walls are removed prior to initiating new foundation construction.

6-2 *MOISTURE-WATER TABLE:* A wet basement caused by seepage from a high water table requires installation of drainage tile.

6-2A EXCAVATION: To install drainage tile, interior or exterior excavation must be completed.

6-2A.1 EXTERIOR: Exterior excavations are used when water table seepage is especially serious and it is desirable to apply a more effective exterior sealant to the basement wall.

6-2A.2 INTERIOR (FLOOR): Interior excavations are used when water table seepage is less serious.

6-2B SEALANT APPLIED: Basement walls are treated with either an exterior (membrane-plaster treatment most effective) or interior less effective sealant.

6-2C INSTALL DRAIN TILE DRYWELL: Drywell is generally constructed to receive drain tile runoff.

6-2C.1 COVER TILE-ROCK AND SOIL: To facilitate drainage into the tile, rock fill is used first followed by soil (and in the case of interior excavations, the basement is repoured).

6-2C.2 CONNECT TO DRYWELL: Tile is connected to drywell.

6-2C.3 INSTALL SUMP PUMP: Sump pump is installed to discharge drywell runoff. (Note: Pump may require new wiring circuit. Although some communities allow drywell-sanitary sewer connections, this undesirable practice is diminishing and thus necessitating sump pumps in most cases.)

6-2D WATER TABLE MOISTURE CORRECTED: With proper installation and inspection, water table moisture problem is corrected.

7. **MINOR DEFICIENCIES:** Relatively minor foundation (and basement) problems should be corrected early in the remodeling-construction process.

7-1 *MOISTURE-SURFACE RUN-OFF:* Seepage due to exterior moisture run-off usually can be corrected without excavation.

7-1A SLOPE GRADE AND INSTALL GUTTERS: Exterior moisture should be directed away from the basement through gutter-downspouts, splash blocks, and lawn-walk areas sloping away from the dwelling.

7-2 *MOISTURE-CONDENSATION:* Condensation problems are generally the easiest to correct.

7-2A REMOVE HUMIDITY SOURCES: Dryers are vented, bathing and cooking areas are vented.

7-2B REDUCE HUMIDITY: In addition to venting moisture producing appliances and activities, humidity may be reduced by increasing heat and ventilation or or by mechanical dehumidifiers.

7-2C DEHUMIDIFY: Mechanical dehumidifiers can remedy moderate condensation problems.

7-2D INCREASE HEAT AND VENTILATION: Condensation problems frequently may be corrected by increasing both heat (warm air holds more moisture) and ventilation (reduces mildew problems).

7-3 *DETERIORATED MASONRY:* Minor cracks, holes, and soft masonry, while not serious, should be repaired to reduce moisture, insect, and rodent problems.

7-3A REPLACE MASONRY: Deteriorated areas can be repaired simply by removing loose and deteriorated material and replacing with a patching cement.

7-4 *MINOR DEFICIENCIES CORRECTED:* With proper installation, minor moisture and foundation problems are corrected.

8. **HOME REPLACED-LEVELED:** If home has been raised to repair an existing foundation or to install a new foundation, it is replaced and leveled.

9. **CORRECT STRUCTURAL DEFICIENCIES:** Following correction of foundation problems, any structural framing deficiencies should be improved.

9-1 *ROOF FRAMING:* Sagging or bowed roof rafters and ridges should be corrected.

9-1A REPLACE SHEATHING AND RAFTERS: If rafters are undersized or weakened, they must be replaced as well as sheathing damaged by moisture. Rafter and sheathing replacement involve reroofing.

9-1B ADD SUPPORT BEAM, POST, AND FOOTINGS: If main beam under floors is undersized or weakened, an additional support beam and/or post with adequate footings can correct the problem. Likewise, weak rafters may be strengthened by adding a collar beam or kneewall.

9-2 *FLOOR AND CEILING FRAMING:* Noisy, springy floors indicate deficiencies to be corrected.

9-2A REPLACE JOISTS: If joists are substantially deteriorated, replacement will be necessary. (Note: Finished structural lumber available today will vary in size from that found in older homes.)

9-2B ADD STRUCTURAL BRIDGING OR COLLARS: If joists are weakened, collars may be used. Bridging strengthens and makes floors more rigid.

9-3 *WALL FRAMING:* If exterior walls bow or are otherwise distorted, they may require reframing if foundation corrections have not resolved the problem.

9-3A SHIM AND LEVEL: Door and window headers may require shimming and leveling if minor binding occurs. If headers noticeably sag, replacement will be necessary.

10. **STRUCTURAL WORK INSPECTED:** It is desirable and necessary in most communities to have structural work inspected by a local building inspector.

11. **CORRECT MECHANICAL SYSTEM DEFICIENCIES:** Following completion of structural work, mechanical deficiencies should be corrected. Local housing or building inspectors will assist you in evaluating mechanical systems.

11-1 *PLUMBING:* Replacement or repair of elements of the plumbing system in old houses is frequently necessary.

11-1A WASTE SYSTEM: Broken, cracked, rusted, clogged or otherwise inadequate waste lines should be replaced. Proper venting and trapping of fixtures is critical to the safety of family members and must be corrected immediately if deficient.

11-1B FRESH SYSTEM: Low water pressure, hammering noise, frozen shut-off valves, and leaking water supply lines are symptoms of problems necessitating repair or replacement of fresh water plumbing lines.

11-1C REPLACE FIXTURES: Bathtubs, toilets, and sinks are seldom replaced because of failure. If replaced because of appearance, new fixtures should be selected during replumbing work.

11-2 *HEATING :* Replacement of an entire heating system is frequently a matter of comfort and convenience rather than necessity. More frequently, the heating plant will require replacement. Flues should be checked for deterioration.

11-2A HOT WATER RADIANT: If system does not provide even heat, an expert may be required to remove air locks.

11-2B STEAM SYSTEMS: Steam systems are generally extremely durable and seldom require replacement.

11-2C AIR SYSTEMS: Gravity air systems generally are replaced to eliminate monstrous large ducts in the basement rather than out of necessity. In either gravity or forced air heating plants, unsatisfactory operation may be caused by cracked plenums and combustion chambers and undersized ducts.

11-2D CONVERSION: Leaks in concrete floor, hot-water radiant systems are expensive to repair and may necessitate conversion to another system such as baseboard radiant (water or electric radiant). One pipe or gravity steam systems may be converted to two-pipe systems for better control and heat response. Circulating pumps may be added to two-pipe steam systems to convert into hot water radiant systems with baseboard units replacing radiators.

11-2E SUPPLEMENT: In situations where the heating system is basically satisfactory with the exception of small areas, supplemental units such as electric radiant baseboards units may be installed.

11-3 *WIRING:* Common wiring problems needing attention include: inadequate capacity (100 amp is minimum for new homes); overloaded, overfused circuits; frayed wires; extension cords and octopus plugs (insufficient outlets); insufficient lighting fixtures; inoperative outlets; etc. Consult your local electrical inspector.

11-3A ELECTRICAL RADIANT HEATING: Electric baseboard and radiant panels seldom need replacement unless heating elements burn out or are broken.

11-3B DISTRIBUTION: If home wiring does not meet the following standards, additional circuits are desirable: maximum of 10 outlets and fixtures on each 15 amp circuit; maximum of 375 square feet of floor area per 15 amp circuit or 500 square feet per 20 amp circuit; separate circuits to kitchen and laundry areas.

11-3C REPLACEMENT: If the following exist, replacement is necessary: exposed knob and tube wiring within 8 feet of floor; open splices; extension cords used as permanent wiring; frayed wires; and loose or broken boxes, switches, and outlet covers.

11-3D ADDITIONS: If service or circuits are inadequate for electrical needs, additional service and/or circuits are necessary.

12. **MECHANICAL WORK INSPECTED:** It is desirable and necessary in most communities to have mechanical work inspected by local building inspectors.

13. **CORRECT EXTERIOR ENVELOPE DEFICIENCIES:** Roofing, siding, window and door problems should be corrected before interior finish work begins. If these problems are serious, they may also need to be corrected before work on mechanical systems begins.

13-1 *ROOFING:* Replacement of roofing may be necessary if the following exist: curled or missing shingles; water-stained walls or ceilings.

13-1A ROOFING STRIPPED: Generally, if two or more layers of asphalt shingles are present, existing shingles should be removed before reroofing.

13-1B FLASHING INSTALLED: If valley and other metal flashing is deteriorated, new flashing should be installed.

13-1C ROOFING INSTALLED: New roofing material is installed.

13-2 *SIDING:* Replacement or repair of siding material is necessary if excessive deterioration is present.

13-2A WOOD SIDING AND TRIM: Curling, capping, splitting, and paint failure are symptoms of potentially serious problems.

13-2A.1 SIDING REMOVED: If siding or trim has seriously deteriorated, it should be removed.

13-2A.2 SIDING INSTALLED: Siding and trim as well as new metal drip caps are installed. (Note: Moisture condensation problems caused by an inadequate vapor barrier must be corrected first.)

13-2B MASONRY VENEER: Motar joints in brick veneer should be solid. Stucco surfaces should be free from open cracks and bowing (may indicate rotted lath).

13-2B.1 VENEER REMOVED: If substantial deterioration has taken place, loose masonry should be removed.

13-2B.2 VENEER INSTALLED: New masonry veneer is installed.

13-3 *WINDOWS AND DOORS:* Since windows and doors in many older homes were handmade and frequently poorly maintained, repair or replacement is often necessary.

13-3A DOORS AND WINDOWS REMOVED: If windows and doors are to be replaced, old units are removed.

13-3A.1 OPENING REFRAMED OR NEW: If windows or doors are to be replaced or if new windows or doors are to be added, openings are framed to the size of the units.

13-3A.2 DOORS AND WINDOWS REBUILT: If attempting to restore the home's original character, deteriorated doors and windows may be rebuilt rather than replaced.

13-3A.3 DOORS AND WINDOWS INSTALLED: New or rebuilt windows and doors are installed and checked for proper operation.

14. **EXTERIOR ENVELOPE DEFICIENCIES CORRECTED:** Inspect all completed exterior work (especially before paying subcontractors).

15. **CORRECT PLAN DEFICIENCIES:** With all structural, foundation, mechanical, and exterior deficiencies corrected, you may turn to interior improvement.

15-1 *CIRCULATION:* Short, direct circulation between rooms and entrances is desirable whereas circulation through rooms, especially across the center, is not layout.

15-2 *LAYOUT AND ZONING:* A good floor plan separates rooms into three basic areas: public (living room, dining room), private (bedrooms, bathrooms), and service (kitchen, laundry).

15-3 *NEW OPENINGS:* One way to correct circulation and layout-zoning problems is by relocating or enlarging door openings or by removing walls.

15-3A LOAD-BEARING: If the wall in which the opening is to be placed in a load-bearing wall (i.e. supporting the ceiling or roof), special precautions must be taken.

15-3B TEMPORARY SUPPORT: Before openings are cut in load-bearing walls, temporary support may be necessary.

15-3C NON-LOAD-BEARING: Openings in non-load-bearing walls are relatively simple and generally do not require temporary support.

15-4 *PARTITIONS:* Another way circulation and layout-zoning problems may be corrected is by building partition screen-walls or by closing off unneeded doors (e.g. many kitchens in older homes have as many as seven doors).

15-4A SCREEN-WALLS: Screen-walls are simply partitions built to visually separate circulation or other activities from a room.

15-4B STORAGE UNITS: Screen-walls can function as storage units if so planned.

16. **FRAMED:** After new openings have been cut, partitions planned, and the decision made that old openings should be closed, the framing for these changes may be completed.

17. **CORRECT INTERIOR MATERIAL DEFICIENCIES:** When framing changes have been completed, you can begin to correct worn and deteriorated floors, walls, ceilings, and trim.

17-1 *WALLS AND CEILINGS CORRECTED:* Deteriorated or damaged walls and ceilings are repaired, replaced, and/or refinished.

17-1A SURFACE REPAIRED: If only minor deterioration has occurred, wall and ceiling surfaces may be repaired (e.g. filling holes, touching up scratches, etc.)

17-1B SURFACE REPLACED: If major deterioration or alternation has occurred, replacement of wall and ceiling surfaces may be necessary (e.g. removing old lath and plaster and replacing with drywell).

17-1C SURFACE REFINISHED: If the wall or ceiling surface is in good repair (or if newly installed), it may be refinished with paint, paper, or paneling.

17-1D LIGHT FIXTURES INSTALLED: After the wall and ceiling surfaces have been finished, light fixtures and switch and outlet plates may be installed.

17-2 *FLOORS CORRECTED:* Deteriorated or damaged floors are repaired, replaced, and/or refinished.

17-2A FLOORS REPLACED: Seriously damaged floors (e.g. rotted, warped, worn, etc.) necessitate replacement of at least the finished and perhaps sub-floor.

17-2B FLOORS REPAIRED: If damage or deterioration is minor, the floor may be repaired (e.g. inserting new tile, renailing wood floor boards, etc.)

17-2C FLOORS REFINISHED: Wood floors may need to be sanded, stained, and sealed.

18. **INTERIOR TRIM COMPLETED:** After floor, wall, and ceiling problems have been corrected, the interior trim may be replaced or refinished.

19. **FINAL INSPECTION COMPLETED:** Local building inspector will give a certificate of occupancy when all work has been completed to at least meet local code requirements.

20. **JOB COMPLETED.**