Appendix A. Explanations

PROPERTIES INCLUDED IN THIS REPORT

This report presents improvement and repair expenditures by property owners for residential properties in the 50 states and the District of Columbia, with the exceptions noted below. These data cover single and multiunit structures, publicly and privately owned structures, nonfarm and farm properties, and residential properties that are occupied by owners or renters or are vacant.

Information on properties classified as primarily nonresidential is excluded, even though such properties may contain some residential space. Residential properties are defined as those having half or more of the enclosed space devoted to nontransient residential use. Also excluded are residential structures on the grounds of institutions, schools, convents, Armed Forces installations, etc.; hotels, motels, tourist cabins, manufactured homes, and boarding houses; and unusual living quarters, such as tents, boats, etc.

Expenditures made by renters are not included in this report. A study of renters' expenditures in 1989 showed that they accounted for less than 1 percent of all expenditures for improvements and repairs.

EXPENDITURES INCLUDED IN THIS REPORT

The expenditures covered in this report are those connected with construction activity intended to maintain or improve the property. The expenditures involve expenses for maintenance and repairs, additions, alterations, and major replacements that are made on the property by the owners. Included are all costs, for both the inside and outside of the house, whether on the main dwelling, on other structures on the property incidental to the residential use of the main dwellings, or for the grounds on which the structures are erected.

As a general principle, expenses connected with items not permanently attached or firmly affixed to some part of the house or property are not included in the report. Thus, expenses connected with the repair or replacement of household appliances, such as stoves, refrigerators, television sets, room air-conditioners, etc., are excluded, as are costs connected with house furnishings such as furniture, rugs, and draperies. While the cost of appliances is excluded, the construction cost of building-in such appliances (e.g., the cost of building-in a wall oven) is included in the scope of this report.

Everyday household and housekeeping expenses, such as waxing floors and furniture, cleaning walls and windows, etc., are not within the scope of this report. Expenditures for grading, draining, fencing, and paving are included, but costs of landscaping (i.e., planting of flowers, trees, shrubs, etc.) are not included in this report.

Kinds of Expenditures

Expenditures included in this report cover work done under contract or by hired labor, materials purchased by owners, and the cost of purchasing or renting tools and equipment for purposes of carrying on jobs that fall within the scope of the report. However, no attempt is made to estimate or include the value of labor in do-it-yourself jobs.

Timing of Expenditures

For one-to-four-housing-unit properties with one unit owner-occupied and owner-occupied condominiums, expenditures are reported in the month of payment for labor and materials regardless of when the work was done.

For one-to-four-housing-unit properties with no unit owner occupied and all properties with five housing units or more, expenditures appear in the quarter in which they are found in the owners' or managers' records.

PROPERTY CHARACTERISTICS

Residential Property

A property consists of the land in one ownership unit, all residential structures on this land, and any facilities attached to the land. It includes the house and additional residential structures on the land, and auxiliary nonresidential structures, such as a garage or a workshop. For the nonresident owners and owners of properties with five housing units or more, property identification is generally determined by bookkeeping practices. Groups of buildings owned by one person or organization can be classified as one or more properties, depending on whether separate expenditure data are kept by the owner.

Housing Unit

In general, a housing unit is a group of rooms or a single room occupied as separate living quarters by a family, a group of unrelated persons living together, or by a person living alone. Vacant living quarters that are

intended for occupancy as separate quarters are also housing units. Separate living quarters are defined as having either (1) direct access from the outside or through a common hall, or (2) a kitchen or cooking equipment for the exclusive use of the occupants.

REGIONS

The standard census geographic regions are used in the tables of this report. States contained in each region are as follows: **Northeast**—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, and New Jersey; **Midwest**—Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, and South Dakota; **South**—Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Kentucky, Arkansas, Louisiana, Oklahoma, and Texas; **West**—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Idaho, Alaska, Washington, Oregon, Nevada, California, and Hawaii.

TYPES OF EXPENDITURES

Expenditures are classified broadly as either maintenance and repairs or construction improvements. Improvements are further classified as additions to residential structures, alterations within residential structures, additions and alterations on property outside residential structures, and major replacements.

In general, when a maintenance or repair job is undertaken as part of a more extensive alteration or construction improvement, the cost of it is reported with the alteration or improvement of which it is a part. For example, repair of a floor as part of remodeling a room is reported with the alteration.

Maintenance and Repairs

Expenditures represent current costs for incidental maintenance and repairs that keep a property in ordinary working condition, rather than additional investment in the property.

Maintenance includes expenses for painting, papering, floor sanding, furnace cleaning or adjustment, etc. Repairs include many kinds of expenditures for plumbing, heating, electrical work, and other kinds of activity involved in the upkeep of residential properties. Repairs also include replacements of parts and of whole units, except for a select list specified below as major replacement expenditures. For example, roof repairs (including replacement of shingles, gutters, etc.) are classified under maintenance and repairs, but a complete reroofing is classified as a major replacement. Plumbing repairs may include extensive replacement of water pipes, but if the entire piping system is removed and a new one put in, the expenditures for the work are classified as major replacements.

Maintenance and repairs do not include expenses for trash and snow removal, lawn maintenance and landscaping, or cleaning and janitorial services.

Construction Improvements

Expenditures for construction improvements are capital expenditures, which add to the value or useful life of a property. Since the classification is based on the concept of additions, alterations, and major replacements rather than dollar value, some very small expenditures, which may not be considered capital investments are included among the improvements, such as installing a new electrical socket or garbage disposal. Construction improvements, as noted above, cover additions to residential structures, alterations within residential structures, additions and alterations on properties outside residential structures, and major replacements.

Additions to residential structures. These refer to the actual enlargement of the structure, either by adding a wing, room, porch, attached garage, shed, or a carport, or by raising the roof, or digging a basement.

Alterations within residential structures. These include changes or improvements made within or on the structure. The changes or improvements range from a complete restructuring, which involves removal of the entire interior of the structure and remodeling it, to the installation of a new electric service outlet, wall switch, or new shelves.

Additions and alterations on property outside residential structures. These include laying or improving walks or driveways; building walls or fences; creating or improving recreational facilities such as swimming pools, tennis courts, barbecue fireplaces; constructing detached garages, sheds, patios, green houses, or the improvement of these by the installation of electricity, drains, or new storage facilities. Grading and filling are included, but not landscaping.

Major replacements. The following is a list of relatively expensive items that, when replaced, are considered to be construction improvements as opposed to repairs:

- Complete furnace or boiler
- Entire roof
- Central air-conditioner
- All siding
- Water heater
- Entire electrical wiring
- Doors
- Plumbing fixtures
- All water pipes
- Windows
- Septic tank or cesspool
- Sink or laundry tub
- Complete walks or drive ways
- Garbage disposal unit

In general, the distinction between major replacements and additions and alterations is that major replacements are not innovations. Installation of a bathtub, where there had not been one before, is an alteration, but the substitution of a new bathtub for an old one is a major replacement.

Appendix B.
Survey Methods and Reliability of Data

INTRODUCTION

This appendix describes the data sources, sample design, and estimation procedures used to develop quarterly estimates of expenditures for the improvement and repairs to residential properties. This description refers to the revised survey methods effective with fourth-quarter 1984 data. A description of the earlier methods appears in Construction Reports C50-84-A, issued April 1985.

SOURCES OF DATA

The data presented in this report are compiled from two sources:

1. Household survey of a sample of consumer units.
2. Mail survey of owners of a sample of rental or vacant properties.

Household Survey

Description of survey. Data based on personal interviews are obtained from household members as part of the Consumer Expenditure (CE) Surveys conducted by the U.S. Census Bureau for the Bureau of Labor Statistics (BLS). The CE surveys are designed to collect data on major items of consumer expense, household characteristics, and income. The expenditures covered by the survey are those that respondents can be expected to recall fairly accurately for 3 months or longer, including expenditures for maintenance and repairs and improvement of properties. Each sample household is interviewed once per quarter for five consecutive quarters.

For the initial interview, information is collected on demographic and family characteristics and on the inventory of major durable goods of each consumer unit. Construction expenditure information is also collected in this interview, using a 1-month recall, and is used solely for bounding purposes: that is, to prevent the reporting of expenditures outside the reference period in subsequent interviews.

The second through fifth interviews use uniform questionnaires to collect expenditures for the previous months and the current month to date. Six months of data collection are required to account for all the expenditures for a quarter.

Households that move from their sample address between interviews are dropped from the survey. New households that move into the sample address are screened for eligibility and included in the survey, if found qualified.

Sample design. The sample for the CE survey is a national probability sample of households designed to be representative of the urban U.S. civilian population. The eligible population is composed of all civilian noninstitutional persons.

The second step in sampling was the selection of primary sampling units (PSUs) that consist of counties (or parts thereof), groups of counties, or independent cities. The set of sample PSUs used for the survey is composed of 105 areas. The PSUs in this part of the design are classified according to the following four categories: “A” PSUs, which comprise 31 self-representing areas, and are large metropolitan statistical areas with nonfarm population greater than 1.2 million, plus the Anchorage and Honolulu MSAs; 46 “B” PSUs defined as nonself-representing metropolitan areas; 10 “C” PSUs defined as urban nonmetropolitan areas; and 18 “D” PSUs defined as rural nonmetropolitan areas. The “B,” “C,” and “D” PSUs were selected using a controlled selection procedure to ensure a distribution across states and other stratifying characteristics.

The sampling frame (the list from which housing units were chosen) for this survey was generated from the 1990 census 100-percent detail file, augmented by a new construction permits frame, and an area sample frame to represent all areas that do not have good 1990 census addresses, which are in nonpermit areas, or which have permit office problems.

The sample design is a rotating panel survey. Each rotation comprises one-fourth of a sample and is interviewed for five consecutive quarters. In each quarter, the housing units in five rotations are interviewed, but the rotation that is being interviewed for the second time is used solely to bound the data to be collected in the four subsequent quarters. Allowing for the bounding interviews and for nonresponse (including vacancies), the number of interviews per quarter is targeted at 5,000.

Estimation and data adjustment procedures. Estimates of expenditures for improvements and repairs are tabulated from responses to the CE questionnaire (CE- 302), Section 5, "Construction Repairs, Alterations, and Maintenance of Property," and Section 7, " Household Equipment Repairs, Service Contracts, and Furniture Repair and Reupholstering" by owner occupants of one- to four-unit properties and condominiums. Each sample household included in the survey represents a given number of households in the United States. The sum of the weighted sample households is the estimate of total households in the United States or the universe. The translation of sample households into the universe of households is known as weighting.

There are five basic steps in determining the weight for each interviewed household:

1. The basic weight assigned to a household is the PSU weight multiplied by the within PSU sampling interval. The PSU weight is the inverse of the PSU's probability of selection.

2. A subsampling factor adjusts for sampling that is done in the field.

3. A new permit factor is an adjustment made to the new permit sample that is introduced in that month for the other panels.

4. A noninterview adjustment factor adjusts for interviews that could not be collected from occupied housing units because of refusals or because no one was home. The adjustment is performed as a function of region, tenure, family size, and race.

5. A second stage adjustment factor adjusts the sample estimates of the population to independently derive census population estimates.

Mail Survey

Description of the survey. Nonresident owners of rental or vacant properties with one to four housing units and owners of rental or vacant properties containing five housing units or more, as identified in the CE household survey, are mailed a questionnaire to report detailed maintenance and repairs and improvement expenditures for their entire property. Approximately 3,000 owners are queried each quarter.

All mail questionnaires, including those from the initial mailing, are used in the tabulation of data for this report. This is based on an assumption that owners of rental properties keep detailed records of their expenditures for improvements and repairs and that the reports would be based on such records rather than on memory alone.

Sample design. The mail survey consists of owners of the properties identified in the household survey as being one to four unit properties with no resident owner and all properties (excluding owner occupied condominiums) with five housing units or more. The probability of selection of a property is proportional to the number of housing units in the property.

Estimation and data adjustment procedures. The data collected on form SORAR-705 are adjusted for unreturned or unusable forms by region and MSA status. The weights are adjusted so that sample counts of renter occupied and vacant housing units agree with independently derived controls from the Current Population Survey.

RELIABILITY OF DATA

The statistics in this report are based on sample surveys and may differ from statistics that would have been obtained from a complete census using the same forms and procedures. An estimate based on a sample survey is subject to both sampling error and nonsampling error. The accuracy of a survey result is determined by the joint effect of these errors.

Measures of sampling errors. Sampling error reflects the fact that only a particular sample was surveyed rather than the entire population. The sample selected for the CE survey is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Estimates derived from the different samples would differ from each other. The standard error, or sampling error, of a survey estimate is a measure of the variation among the estimates from all possible samples and, thus, is a measure of the precision with which an estimate from a particular sample approximates the average from all possible samples.

Estimates of standard errors have been computed from the sample data for statistics in this report. They are presented in the tables in the form of relative standard errors. The relative standard error equals the standard error divided by the estimated value to which it refers.

The sample estimate and an estimate of its standard error allow us to construct interval estimates with prescribed confidence that the interval includes the average result of all possible samples with the same size and design. A 90-percent confidence interval is defined to be from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate. If all possible samples were selected and surveyed under essentially the same conditions and all the respective 90-percent confidence intervals were generated, then approximately 90-percent of the intervals would include the

average value of all sample estimates and approximately 10-percent would not include this estimate. For example, this report shows that residential property owners spent $38.6 billion for improvements and repairs in the fourth-quarter 2001 and the average relative standard error of this estimate is 8 percent. Multiplying $38.6 billion by .08, we obtain $3.1 billion as the standard error. To obtain a 90-percent confidence interval, multiply $3.1 billion by 1.6, yielding limits of $33.6 billion and $43.6 billion ($38.6 billion plus or minus $5.0 billion). The average estimate for the specified quarter may or may not be contained in this computed interval, but one can say that the average estimate from all possible samples is included in the constructed interval with a specified confidence of 90 percent.

The sampling errors of some estimates are too great to allow meaningful comparisons among these estimates. The sampling errors should be regarded as orders of magnitude rather than absolute measurements.

Nonsampling errors and other limitations. As calculated for this report, the estimated relative standard errors measure certain nonsampling errors, but do not measure any systematic biases in the data. Bias is the difference, averaged over all possible samples with the same size and design, between the estimates and the true value being estimated. Nonsampling errors can be attributed to many sources: inability to obtain information about all cases in the sample; definitional difficulties; differences in interpretation of questions; inability or unwillingness of respondents to provide correct information; and errors made in processing the data. These nonsampling errors also occur in complete censuses. Although no direct measurements of the biases have been obtained, it is believed that most of the important response and operational errors were detected in the course of reviewing the data for reasonableness and consistency.

Six potential sources of bias are:

1. Nonresponse to the survey as a result of selecting housing units from the permit frame for which addresses are no longer available at the permit office.
2. Nonresponse resulting from interview refusal or because no one was home.
3. Undercoverage in the sampling frame with respect to demographic and family characteristics of sample consumer units.
4. Memory failure, including failure to remember exact values, and the reporting of information for an earlier or later time period than when it actually occurred (telescoping).
5. Problems in classifying the types of jobs performed.
6. Adjustment for extreme values (“outliers”) where an unusually large weighted value or more is contributed by a single job.

Appendix C.
Adjustments for Seasonal Variations

ADJUSTMENTS FOR SEASONAL VARIATIONS

Quarterly estimates of expenditures for improvements and repairs are adjusted to eliminate the effect of changes that normally occur about the same time and in about the same magnitude each year. The seasonally adjusted estimates are converted to annual rates by multiplying by 4. Estimates for expenditures at seasonally adjusted annual rates are shown in Table 1.

The factors used for making the adjustment were developed using the X-12-ARIMA, an enhanced version of the X-11 variant of the Census Method II seasonal adjustment program. A description of the X-12-ARIMA program appears in "New Capabilities and Methods of the X-12-ARIMA Seasonal Adjustment Program," by David F. Findley et al. of the U.S. Census Bureau.

Table C. **Factors Used to Seasonally Adjust Expenditures for Residential Properties**

Year and quarter	Total expenditures	Maintenance and repairs	Improvements		
			Total	Additions and alterations	Major replacements
1996					
1st quarter	73.4	74.3	72.9	77.4	64.2
2nd quarter	109.0	105.9	110.7	115.5	99.2
3rd quarter	116.6	115.2	117.1	111.2	130.8
4th quarter	100.4	105.6	98.2	96.2	104.5
1997					
1st quarter	73.4	71.9	74.1	77.1	67.0
2nd quarter	109.3	106.9	110.5	115.6	97.7
3rd quarter	116.6	116.3	116.8	111.1	130.6
4th quarter	100.5	105.4	98.7	96.4	104.2
1998					
1st quarter	73.4	70.7	74.6	77.0	68.4
2nd quarter	109.2	107.2	109.9	115.3	96.2
3rd quarter	118.1	117.4	118.5	111.5	131.3
4th quarter	100.9	105.0	98.9	96.3	103.6
1999[r]					
1st quarter	74.7	75.9	74.2	76.3	70.0
2nd quarter	108.6	105.3	110.1	112.9	103.7
3rd quarter	113.9	115.7	113.1	113.6	111.8
4th quarter	102.1	103.0	101.8	97.3	114.5
2000[r]					
1st quarter	74.4	76.0	73.7	76.2	68.6
2nd quarter	110.0	105.4	111.9	112.9	109.9
3rd quarter	112.4	115.8	111.1	113.7	104.0
4th quarter	102.9	103.1	102.8	97.2	117.7
2001[r]					
1st quarter	74.5	76.0	73.7	76.1	67.1
2nd quarter	110.7	105.1	113.1	112.8	113.8
3rd quarter	111.7	115.6	110.1	113.9	99.4
4th quarter	104.6	102.9	105.3	97.1	120.9

[r]Revised.

Supplement.
Expenditures by Job Category, Region, and Selected Property and Household Characteristics

INTRODUCTION

This supplement presents detailed annual statistics on expenditures made by property owners for improvements and repairs of residential properties in the United States.

Table S1 shows annual expenditures by specific type of job for owner-occupied and rental housing. Please note that many of the type of job expenditures shown are subject to high sampling errors and should not be considered as precise estimates.

Comparisons of the data presented in Table S1 with previous years can be made for the major category totals — additions, alterations, outside additions and alterations, major replacements, and maintenance and repairs. However, those specific job types within major categories that existed in years prior to 1993 are no longer comparable with data for recent years.

Table S2 presents annual expenditures by region, property type, and size for 1999 to 2001.

Table S3 presents annual expenditures for owner-occupied one-unit properties by selected property and household characteristics (value of property, year householder acquired unit, income of household, and age of householder) for 1999 to 2001.

Data for this report were collected by personal interview and by mail from a sample of owners of residential properties. General information about the survey including definitions, methodology, and reliability of the data appears in Appendixes A and B of this report.

ADDITIONAL TYPE OF JOB DEFINITIONS

Please refer to the "Type of Expenditures" section of Appendix A for definitions of major categories. The following are additional definitions for categories specific to Table S1 only:

1. "HVAC" includes heating, ventilation, and central air-conditioning systems.
2. "Flooring" does not include carpeting.
3. "Attached garages" also includes attached carports, greenhouses, sheds, and breezeways.
4. "Detached buildings" includes detached garages, carports, sheds, greenhouses, and storm cellars.
5. "Rooms" includes any and all rooms in the residence such as kitchens, bathrooms, family rooms, bedrooms, or sunrooms that are added to increase the floor space of an existing building.
6. If both the kitchen and bathroom were remodeled and the costs could not be separated, the expenditures are reported in the "Kitchen and bathroom remodeling" category, else they are reported separately under the "Kitchen remodeling" and "Bathroom remodeling" categories.
7. "Interior restructuring" includes the creation of a new room or kinds of space within the confines of the original house.
8. "Materials to have on hand" includes expenditures for materials and supplies that are to be used in a future home improvement or repair job.