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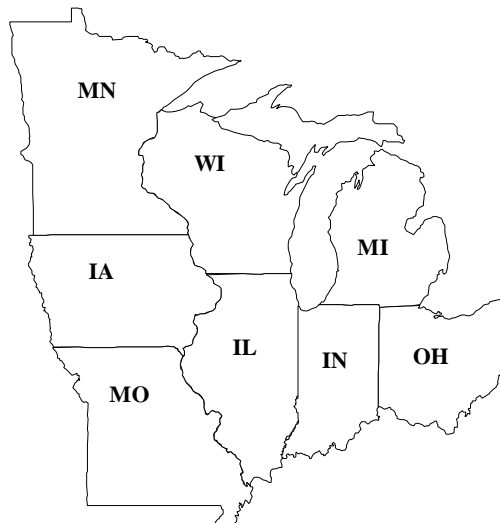
# REGIONAL RENTAL SURVEY



COVERING GOVERNMENT-FURNISHED HOUSING LOCATED IN THE

## NORTH CENTRAL SURVEY REGION

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## I. SURVEY BACKGROUND

The Quarters Management Information System (QMIS) Office coordinated a contractor-conducted field survey of the private rental housing market in the states of Iowa, Illinois, Indiana, Michigan, Minnesota, Missouri, Ohio, and Wisconsin, plus a community just across the state line of Nebraska, from April 2007 through June 2007. This survey was undertaken as specified in the Office of Management and Budget (OMB) Circular No. A-45 and in the U.S. Department of the Interior Quarters Handbook (400 DM.) OMB Circular A-45 provides for reconfirmation of the market-based rental rates at least once every five years, or sooner, if conditions warrant. The last field survey of the North Central region was conducted in April 2003.

The collection and analysis of rental housing data were accomplished employing methods similar to those used in previous surveys. Automated and manual analytical procedures were used to establish base rental rates for houses (including plexes), apartments, mobile homes, and trailer pads. Rental rates for cabins were based upon their comparability with 1-bedroom houses. Rental rates for temporary housing and travel trailers were based upon their comparability with mobile homes. Rental rates for dormitories, bunkhouses and transient units were established by extending the principle of comparability, as provided for in OMB Circular A-45.

The objective of regional surveys, as set forth in OMB Circular No. A-45, is to develop reasonable rental rates based upon the "...typical rental rates for comparable private housing in the general area in which the government quarters are located...." The policy set forth in OMB Circular A-45 is as follows:

Rental rates and charges for government quarters and related facilities will be based upon their "reasonable value...to the employee...in the circumstances under which the quarters and facilities are provided, occupied, or made available."...Reasonable value to the employee or other occupant is determined by the rule of equivalence; namely, that charges for rent and related facilities should be set at levels equal to those prevailing for comparable private housing located in the same area, when practicable...

The regional survey method uses regression analysis techniques to establish a base rental rate for a given type of housing unit that reflects the typical rate for that type of housing in the survey area. Regression analysis allows the QMIS Office to establish adjustments that reflect: (1) the contributory value (+ or -) of housing features that the private rental market indicates are significant; and (2) relevant social and economic factors that are manifested in the rent levels of individual communities.

Because regression analysis permits assessment of (and adjustment for) different locations, as measured by market rents, several localities or states can be surveyed at a time to minimize data collection costs, and the rates can be individualized for communities that are significantly at variance with the regional rent pattern.

The resulting product (finalized rental rates), when derived from carefully applied automated statistical analysis, provides a logical and equitable base rental rate structure supported by the market rental rate pattern of the region and the community.

## II. INVENTORY OF GOVERNMENT-FURNISHED HOUSING

This survey was initiated with an inventory of government-furnished housing managed by the agencies and bureaus that participate in the Quarters Management Information System (QMIS) program.

Agencies and bureaus use the QMIS software to manage their inventories. The QMIS Office in Denver developed this software. QMIS allows an installation or region to maintain its own housing inventory. Rents can be calculated in just minutes, even for hundreds of units. This decentralized system provides local control of the housing inventory. As always, the key to accurate rents is accurate, up-to-date inventory information.

Software with the results of this survey and the updated Consumer Price Index (CPI) is distributed from Denver in January each year. If you do not receive new CPI software, or do not receive procedures for downloading the software by January each year, please contact the QMIS Office (Help Desk at 303-969-5696 or Rental Program Manager at 303-969-5050). This is important because, by regulation, new rents (based on the survey and CPI) must be implemented in early March, and tenants must be notified in writing 30 days prior, by early February.

It is also important that all agencies and bureaus submit a copy of their updated housing inventories to the QMIS Office by May 15 of each year. This information is used to determine the communities and characteristics to be sampled in new Regional Surveys. The information is also used for various general management reports.

## III. CONTRACTING FOR THE PRIVATE RENTAL SURVEY

### A. DETERMINATION OF THE COMMUNITIES TO BE SURVEYED

Selection of the communities to be surveyed in this region was initiated with a review of the nearest established communities identified in the government housing inventory. Their geographic locations and populations were determined to enable selection of established communities nearest to concentrations of government housing.

Inclusion of these communities enables a comparison of the community rental rate structure with that of the survey region. This permits a ready determination of whether the local or the regional rental rate structure should be utilized to establish the government-furnished housing base rents. A complete discussion of this process is contained in Section IV of this report.

The communities surveyed represented broad geographic and population ranges. The largest community surveyed – Chicago, Illinois – had a 2000 population of 2,896,016. The smallest community –

Frankfort, Michigan – had a 2000 population of 1,513. A list of the surveyed communities appears as Table 1. In accordance with OMB Circular A-45, communities with 2000 census populations below 1,500 were not analyzed.

**TABLE 1 COMMUNITIES SURVEYED**

<u>STATE AND COMMUNITY</u>	<u>2000 CENSUS POPULATION</u>	<u>STATE AND COMMUNITY</u>	<u>POPULATION</u>
<b>ILLINOIS</b>		<b>MICHIGAN (continued)</b>	
Chicago, IL	2,896,016	Manistee, MI	6,586
Danville, IL	33,904	Manistique, MI	3,583
Harrisburg, IL	9,860	Milan, MI	4,775
Havana, IL	3,577	Mt. Clemens, MI	17,312
Jonesboro, IL	10,488	Munising, MI	2,539
Marion, IL	16,035	Newberry, MI	2,686
North Chicago, IL	35,918	Reed City, MI	2,430
Westchester, IL	16,824	Saginaw, MI	61,799
		St. Ignace, MI	2,678
<b>INDIANA</b>		<b>MINNESOTA</b>	
Chesterton, IN	10,488	Aitkin, MN	1,984
Dale, IN	1,568	Aurora, MN	1,850
Fort Wayne, IN	205,727	Bemidji, MN	11,917
Indianapolis, IN	781,870	Chaska, MN	17,449
Marion, IN	31,320	Detroit Lakes, MN	7,348
Seymour, IN	18,101	Duluth, MN	86,918
Terre Haute, IN	59,614	Ely, MN	3,724
<b>IOWA</b>		Grand Rapids, MN	7,764
Des Moines, IA	198,682	International Falls, MN	6,703
Knoxville, IA	7,731	Little Falls, MN	7,719
Missouri Valley, IA	2,992	Minneapolis, MN	382,618
West Branch, IA	2,188	Morris, MN	5,068
<b>MICHIGAN</b>		Pipestone, MN	4,280
Battle Creek, MI	53,364	Roseau, MN	2,756
East Tawas, MI	2,951	Sandstone, MN	1,549
Frankfort, MI	1,513	Silver Bay, MN	2,068
Fremont, MI	4,224	Thief River Falls, MN	8,410
Gaylord, MI	3,681	Virginia, MN	9,157
Gladstone, MI	5,032	<b>MISSOURI</b>	
Grayling, MI	1,952	Bloomfield, MO	1,952
Houghton, MI	7,010	Brookfield, MO	4,769
Iron Mountain, MI	8,154	Doniphan, MO	1,932
Iron River, MI	1,929		

Joplin, MO	45,504
	2000 CENSUS
<u>STATE AND COMMUNITY</u>	<u>POPULATION</u>
MISSOURI (Continued)	
Mountain View, MO	2,430
Potosi, MO	2,662
Salem, MO	4,854
Springfield, MO	151,580
Waynesville, MO	3,507
NEBRASKA	
Falls City, NE	4,671
OHIO	
Akron, OH	217,074
Brecksville, OH	13,382
Chillicothe, OH	21,796
Cincinnati, OH	331,285
Coshocton, OH	11,682

STATE AND COMMUNITY POPULATION

OHIO (Continued)	
McArthur, OH	1,888
Oak Harbor, OH	2,841
Port Clinton, OH	6,391
WISCONSIN	
Crandon, WI	1,961
Milwaukee, WI	596,974
Osceola, WI	2,421
Rhineland, WI	7,735
Somerset, WI	2,644
Spoooner, WI	2,653
Tomah, WI	8,419
Viroqua, WI	4,335
Washburn, WI	2,280

**B. DETERMINATION OF THE HOUSING CLASSES TO BE SURVEYED**

In order to determine which housing classes to survey, the inventory of the agencies participating in the QMIS system were separated into housing classes shown in Table 2, below. Analysis of the government-owned housing data revealed the following information by rent class:



**TABLE 2 GOVERNMENT-FURNISHED HOUSING (BY RENT CLASS) IN THE NORTH CENTRAL REGION**

<b>Rent Class</b>	<b># of Units</b>	<b>Avg. Age</b>	<b>Age Range</b>	<b>Avg. Sq. Ft.</b>	<b>Sq. Ft. Range</b>
<b>Houses</b>					
4+ Bedrooms	110	64	3 to 139	3,214	1,250 to 6,955
3 Bedrooms	293	57	2 to 138	2,195	640 to 4,680
2 Bedrooms	109	56	2 to 137	1,506	330 to 2,607
1 Bedroom	35	51	3 to 138	864	360 to 2,313
<b>Apartments</b>					
3+ Bedrooms	12	66	44 to 138	1,727	1,024 to 3,651
2 Bedrooms	20	50	13 to 100	1,082	750 to 1,793
1 Bedroom	28	56	26 to 107	1,019	169 to 2,174
Efficiency	2	48	48	393	393
<b>Cabins</b>	24	53	12 to 127	653	252 to 997
<b>Mobile Homes</b>					
3 Bedrooms	4	8	5 to 15	1,061	723 to 1,800
2 Bedrooms	4	21	16 to 25	844	781 to 913
1 Bedroom	0	-	-	-	-
<b>Travel Trailers</b>	1	6	6	224	224
<b>Dormitories</b>	35	53	1 to 120	2,449	540 to 10,802
<b>Trailer Pads</b>	11	10	3 to 15	-	-
<b>TOTALS</b>	<b>688</b>	<b>56</b>	<b>1 to 139</b>	<b>1,994</b>	<b>169 to 10,802</b>

**NOTE:** The above data was extracted from the latest consolidated database stored by the QMIS Office. Since the program is decentralized, the data contained in this database is only what has been sent to our office by users in the field. The numbers above may not accurately reflect the actual number of units for this survey region.

As with other regional surveys, the contractor was directed to survey only those housing classes for which a representative sample could be readily obtained in the private rental market. Thus, comparables were not obtained for cabins or lookouts, temporary housing, travel trailers, bunkhouses/dormitories, transient units or tents.

Rental rates for cabins were established by using the average rental rate for one-bedroom, single-family houses as the basis of comparison. Additional adjustments that reflect the absence of certain standard housing features in some cabins have been included for use when appropriate.

Since temporary housing and travel trailers (mobile home-like structures containing less than 256 square feet of gross living area) are most structurally similar to mobile homes, the rental charges for these housing classes are based upon the analysis of mobile home market rental comparables.

Since comparable bunkhouse or dormitory housing does not exist in most communities, the QMIS Office is unable to obtain sufficient market data to provide a satisfactory statistical base. Consequently, rental rates for bunkhouses and dormitories have been established using an extension of the Principle of Comparability, as permitted in OMB Circular A-45. Similarly, the rental charge for transient units has been established in conjunction with the dormitory rate structure.

OMB Circular A-45, revised October 20, 1993, excludes tents from the definition of government-furnished housing. Therefore, rental charges have not been established (and should not be assessed) for tents which are used as employee housing.

Four housing classes (houses/plexes, apartments, mobile homes and trailer pads) were ultimately selected for field survey and statistical analysis. The contractor was instructed to select comparables built to Housing and Urban Development (HUD) minimum housing standards wherever possible. The number of observations obtained for each housing class in each community surveyed varied, depending upon the number of nearby government units of that class. The government inventory data was used to create a "Sample Plan" to guide the contractor in the conduct of the survey.

#### C. HEATING FUELS AND UTILITY CHARGE SURVEY

To ensure reliability of the energy consumption estimates for housing where consumption is neither metered nor measured, this report uses a series of contractor-developed heating and cooling consumption tables for each general type of housing represented in the survey. The tables are based upon energy consumption studies that use a methodology meeting housing industry standards. The results reflect energy consumption for variously sized single-family houses (with and without basements), apartments, and mobile homes. A complete discussion of the energy consumption/cost methodology is contained in Section VI.

#### D. CONTRACTOR SELECTION

The National Business Center provided procurement support and project coordination for this Private Rental Survey. Reimbursement for survey expenses was underwritten by the agencies and bureaus that participate in the QMIS Program.

The private rental survey was completed by Delta-21 Resources Inc. of Knoxville, Tennessee, during the months of April 2007 through June 2007. A total of 1,128 private rental housing comparables were sampled. In addition, electrical, heating fuel, utility, appliance, and other related service charges were collected in each of the communities surveyed. The private rental housing costs that were obtained reflected rental rates at that time.

## IV. REGIONAL SURVEY PRINCIPLES AND PROCEDURES

### A. SURVEY PRINCIPLES

The purpose of a regional survey is to determine and establish reasonable housing unit rents through an analysis of the market rents of comparable private housing in communities nearest to the concentrations of government housing. The process of arriving at the base rent of a structure is influenced by real estate appraisal principles, statistical limitations, and administrative considerations. Often there may be a conflict among these three interests, which necessitates a trade-off.

1. Real estate appraisal principles include matching comparables as closely as possible to the specific subject properties in physical characteristics and location, and adjusting in a logical direction for all significant differences.
2. Statistical principles involve: (a) trying to minimize the standard error of the estimate (unexplained variation); (b) getting a good match of characteristics between the properties analyzed and those the analysis is applied to; (c) obtaining a large and diverse sample; and (d) making adjustments for factors that are significant in explaining variation. Ideal samples may not always be available in the market; and the market search may be limited (like an appraisal) because of time and budget constraints.
3. Administrative considerations recognize that government housing is usually not located in established communities, and that physical characteristics (such as in historical houses, one-room cabins, lookouts or dormitories) are difficult to match in the market. Government housing is often found in areas influenced by tourism or boom/bust natural resource development that may produce unreasonable rents. Consistency and relative reasonableness, as well as time and budget constraints, must also be taken into consideration.
4. While trade-offs among these three considerations may result in a less than ideal application of any one of the three principles, the goal is still to produce Monthly Base Rental Rates (MBRR) for housing that is relatively consistent with the local market rents for similar housing, internally consistent and logical from one unit to another, and represent a reasonable value to the employee.

### B. MULTIPLE REGRESSION PROCEDURES USED IN RENTAL RATE COMPUTATIONS

There are several reasons for using the regional survey method to arrive at rental rates. These include accuracy, consistency, fairness, cost effectiveness/economy, and the provision in OMB Circular A-45 that regional rental surveys are the preferred method.

Prior to the use of the regional survey method, Monthly Base Rental Rates (MBRRs) were reset every five years by individually appraising each government unit. The appraisal process normally relied upon the use of a small number (2-4) of comparables for each subject unit, and made logical or market-abstracted adjustments to each comparable. In many instances the same comparables were used to establish rental rates for several housing units. Thus the selection of comparables became critical. Individualized appraisals

often led to inconsistencies among units in the same area. Many times different agencies, managing similar or identical housing units in the same area, had substantially different rents after analyzing the same rental market. Appraisers valuing several different units by separate sets of comparables and adjustments sometimes arrived at rents not logically related to one another. Finally, the appraisal process required a considerable amount of travel, and individualized writing, typing and editing of appraisal reports, which was expensive and very time-consuming.

Alternatively, the regional survey method relies upon much larger samples of comparables. These are statistically analyzed to determine those factors that are significant in explaining variations in the adjusted rent of each class of housing comparables. Each class of comparables (houses, apartments and mobile homes) is analyzed separately to determine which locations and physical characteristics are important in explaining the differences in rents among individual rental units and communities. The computer program independently and objectively determines the best set of characteristics (formula) to explain the rental pattern. This formula varies for each survey region and housing class, but each is primarily based on square feet, bedrooms, bathrooms, amenities, and community market variances.

The rental rates are based upon an analysis of both regional data and local data. The rents in all surveyed communities for each housing class are tested for statistical significance. All significant negative location adjustments are applied to the housing using that community as their nearest established community.

**Positive location (community) adjustments are not applied; so government housing units near high-rent communities are charged the typical rent for the region as a whole, rather than the typical rent for that high-cost location.**

The statistical process used is called forward in-and-out, step-wise multiple regression analysis. It takes all of the variables considered and forms a matrix or grid showing how every variable is related to every other variable (cross-correlation matrix). In this phase of the analysis, significant inventory items relating to the dwelling structure are coded into the computer as variables to be tested for their impact, if any, on rent. The variable to be explained (in this case, rent) is called the dependent variable, because its value is determined by that of the other (independent) variables.

In forward in-and-out step-wise multiple regression analysis, the independent variable that explains the most variation in the dependent variable (rent) is selected first by the computer and entered as Step 1. The remaining variation is then recomputed, and the independent variable that explains the largest portion of the remaining variation is selected by the computer and entered as Step 2. As each new variable is added, the coefficients of all the previously entered variables are recomputed to take into account relationships among the independent variables. If a previously entered variable no longer meets the test of significance, it is removed.

As this procedure uses the variation squared, it is highly sensitive to cases with extreme variations from the norm. Since the purpose of a regional survey is to find the typical rent for housing with certain characteristics, it is useful (and mandatory) to cull comparables with unusually high or low rents that are apparently unrelated to their characteristics. Such non-conforming rentals tend to obscure the typical pattern. To accomplish this culling, the following steps are normally taken.

**Step 1.** A listing of all the comparables is checked to see that the program has proper decodes, that no rental has been entered twice, and that the data is complete for each variable to be tested. The range for each rent class is also checked.

**Step 2.** Regression Run 1 (square foot base formula). The purified database is analyzed for the best fit of adjusted rent versus square feet and the logarithm of square feet. This comparison is undertaken because square footage in buildings is generally the variable that explains the most variation of adjusted rent. It is also a universal variable (one that applies to all cases) and a continuous variable (one that changes in many small increments).

**Step 3.** A listing is produced which shows the rent/predicted rent ratio of each private rental sample by community. The predicted rent is one computed using the square foot base formula derived in step 2. The purpose of this listing is to screen out individual rentals whose ratios are far out of line relative to other rental comparables in the same community.

**Step 4.** A scattergram of rentals for each class, showing adjusted rent by square feet, is produced to visually display the data. These scattergrams, and the listings produced in Step 3 above, are used to remove samples with unusually high or low rents in each size grouping. A separate variable for each of the remaining communities is then entered into the next step, the full regression analysis, to see if it has a statistically significant location adjustment after other adjustments have been made. This run and a crosstab run of physical features allows for selection of other variables that are significantly represented and widely (geographically) distributed. These variables are turned into dummy (yes/no) and combination variables. Continuous and discrete variables are entered as simple variables, logarithmic transformations, and in logical combinations.

**Step 5.** (First Full Regression Run). The screened samples for each housing class, along with the variables to be tested, are analyzed to find coefficients for the significant variables. The results are checked for logic and cross-correlation; normally only one form of a variable is allowed to stay in the equation. Variables with illogical results are checked to find reasons for such deviation from expected results. Such variables are normally dropped from subsequent regression runs. Sometimes the samples containing such variables are culled; however, culling samples is uncommon.

**Step 6.** (Other Full Regression Runs). The full regression analysis is rerun without the illogical variables and/or dropped cases. If the end results look reasonable, the coefficients determined by regression analysis are used to compute Monthly Base Rental Rates (MBRRs) for individual government-furnished housing.

**Step 7.** (Predicted Rent Tables). The coefficients of each satisfactory regression run are put into a computer program which produces a table of predicted MBRRs. The base values and all possible combinations of adjustments are reviewed to ensure the results are reliable for the full range of values. If not, the cause of the problem is diagnosed and corrected, and the regression analysis is re-run, producing a revised set of coefficients. Then Step 6 is repeated, and a new set of rent tables is produced.

## V. ESTABLISHMENT OF MONTHLY BASE RENTAL RATES (MBRR)

### A. USE OF BASE RENT CHARTS

Although rental computations have been automated to produce Monthly Base Rental Rates (MBRRs) and final Net Rents for most units, housing managers should understand the methodology used to determine rental rates. Therefore, a set of charts has been prepared to allow the manual computation of the MBRRs for each class of rental housing. The charts have been constructed as size/age tables for the three major categories of housing (houses, apartments and mobile homes). By knowing the gross square feet of the livable area (size), the age, and the housing class of a building being used, one can determine the base rent from the proper table. The charts also contain columns and/or footnotes of rent adjustments, which modify the rent from the size/age table to produce a MBRR for an individual unit.

**The value of one refrigerator and one stove is included in the rents listed in Tables 3, 4, and 5.**

Therefore, if the government does not provide a refrigerator or a range in the unit, the value of each non-provided appliance should be subtracted from the monthly rent. The current values of a refrigerator and range are shown in Table 18 of this report, and may be adjusted annually by the QMIS Office to reflect changes in the Consumer Price Index (CPI) which occurs in November, following the issuance of this report.

In selecting the appropriate rent table, it is important to remember that the **design of the housing unit, not its use, determines its category**. Thus, a house or an apartment unit **designed** to be occupied by an individual or a family, but which is actually used to house unrelated individuals, would be valued by the category for which it was designed to be used, rather than as a bunkhouse/dormitory. Where a structure is not designed for occupancy by an individual or family, or has been substantially modified to house individuals on a dormitory basis, it would be appropriate to apply bunkhouse/dormitory rates. Thus, an unmodified three-bedroom house with a **planned occupancy** of six unrelated individuals (normally two persons per bedroom) would have a rental rate determined by calculating the rental rate for a three-bedroom house and then dividing that rate by six. This rate would change if the number of **planned** occupants changed. If the house were later **structurally modified** to be used as a bunkhouse/dormitory, the rate then would be the dormitory rate.

Based upon information provided by the contractor, deductions from the monthly contract rental rate of each rental sample were made for the contributory costs of utilities, appliances, furnishings and services provided and included in the contract rent. No deductions were made for central air conditioners, refrigerators or ranges; however, if a refrigerator or range was missing, the value was added to the adjusted rent. Central air conditioners are valued at their contributory value, if any. The resulting adjusted monthly contract rental rate represents the contributory value of the dwelling structure equipped with a refrigerator and a range. The establishment of final monthly rental charges for houses, apartments, mobile homes and cabins/lookouts requires the addition of charges for government-provided utilities, services, appliances and furnishings. Conversely, **deductions** are required for the values of ranges and refrigerators when they are not provided by the government.

There are a total of nine rental rate charts: four charts for single-family housing, four charts for apartments, and one chart for mobile homes. Instructions for computing rental rates for cabins, bunkhouses and dormitories, transient units and trailer pads are found in Sections V.E, V.F, V.G and V.H, respectively. Because OMB Circular A-45 excludes tents from the definition of “rental housing,” there is no charge for the provision of tents.

The use of the charts is fairly simple. First, find the chart for the rental class category of the government quarter. Next, round the finished square footage **down** to the nearest hundreds of square feet. Thus, if a unit has 980 square feet, the row labeled “900 Sq Ft” would be used. Then the age should be rounded **up** to the nearest age increment. (Always round to benefit the tenant.) If the dwelling at issue was built in 1983, its age would be computed as 2007 (the current year) minus 1983 (the year built). Thus, in this instance, the unit is  $2007 - 1983 = 24$  years old; and the column headed by “25 Yrs Old” should then be followed down to the “900 Sq Ft” row to obtain the size/age adjusted rent.

The rent charts also have various location adjustments, as well as adjustments for physical features such as the number of bathrooms, the type of garage facilities, the condition of the housing, etc. These should be subtracted from, or added to, the size/age adjusted rent, as specified, to determine the MBRR.

When computing the final rent (net rent) to be paid, the MBRR must be adjusted to include the value of government-provided related facilities (utilities, appliances, furnishings and services); and the administrative adjustments prescribed in OMB Circular A-45. Use the Department of the Interior Form DI 1880, “Rent Computation Schedule,” for guidance. (Manual rent calculations also require information from the most recent Consumer Price Index (CPI) Memo published by the QMIS Office.)

Where a dwelling is larger than the highest square footage in the chart pertinent to that unit, use the size/age rent and adjustments from the bottom (largest “Sq Ft”) row. Rent is “capped” at the largest “Sq Ft” indicated on each chart. This may eliminate the need for some administrative adjustments due to excess size of the housing. If a dwelling is smaller than the smallest square footage, use the lowest square footage listed on the chart.

The rent for a dwelling with more than 4 bedrooms (3 bedrooms for apartments and mobile homes) is calculated as if the unit had 4 bedrooms (“capped” at 3 bedrooms for apartments and mobile homes). The carport charge is the same regardless of the size of the carport; and the fireplace charge is the same for one or more fireplaces. In addition, a “cap” of 3 bathrooms applies.

To assist in the calculation of housing MBRRs, examples are provided in the following pages. While the rates appearing in the following tables should allow users to establish MBRRs for essentially any property, not all situations and conditions can be anticipated. Therefore, housing managers should use professional discretion to set rates for truly unusual situations. In cases where housing managers must use some other method to establish rates, please contact the National Business Center QMIS Office, at **303-969-5696 or 303-969-5050**, or fax 303-969-6634. You should explain the conditions, the rate used, and the reasoning so that the QMIS Office may anticipate such circumstances in the future. Please retain the documentation for such actions in your housing management files.

## B. SINGLE FAMILY HOUSING

For single-family detached houses, including plexed dwellings and townhouses, use the rental chart which appropriately describes the housing class and the number of bedrooms of the subject unit. The charts for houses are in Tables 3a through 3d.

For example, assume a 3-bedroom, 1½-bath house, that was built in 1974, and which has a 2-car garage, two fireplaces, a central refrigerated air conditioning system, and 1,276 gross square feet of living space. The house, located near Pipestone, Minnesota, is “fair” in both exterior and interior condition.

First, the chart for 3-bedroom, good condition, 1 bathroom, houses (Table 3b) should be located and used. These charts are baseline charts, which assume that each house is in good condition inside and outside and has one full bathroom. Therefore, if the house is in “good” condition inside and outside and has one bathroom, no additional computations are needed. If there is a deviation from either “good” inside or outside condition, or there are less or more bathrooms than one, then the computations must be changed as discussed below. In the first step, Table 3b is selected as the proper chart for 3-bedroom houses. Next, the size (gross finished floor space) should be rounded **down** to the nearest 100 square feet (from 1,276 to 1,200 sq. ft.) Under the column headed “**Sq Ft**,” the figure 1,200 should be located. Further adjustments will be taken from this row.

Finally, the appropriate age column should be selected. The house in this example is  $2007 - 1974 = 33$  years old. The age should be rounded **up** to the next highest age column, which, in this case, is the column headed “**35 yrs old**.” Follow this column down to the 1,200 square feet row to obtain the size/age “Chart Rent” of \$575.

The first adjustment is the extra bathroom charge. Follow the column headed “**Per Extra Bath**” down to the 1,200 Sq Ft row to find a charge of \$77 for a full extra bathroom. As the house in this example has only ½ of an extra bathroom, the adjustment is  $\$77 \times .5$  (½ extra bathroom) = \$39. Add \$39 to the rent.

The second and third adjustments are made for a fair exterior and a fair interior condition. Follow the column headed “**Fair Exterior/Interior\***” down to the 1,200 Sq Ft row. The amount reflects a deduction of -\$10 for a house with a fair exterior **and** a deduction of -\$10 for a house with a fair interior. Since both the exterior and interior are in fair condition, the total adjustment is -\$20.

The fourth adjustment is for the central refrigerated air conditioning system. Follow the column headed “**Air Cond**” down to the 1,200 Sq Ft row. The amount reflects an addition of \$31 for central air conditioning.

The fifth adjustment is for a two-car garage. Follow the column headed “**Garage (Per Car)**” down to the 1,200 Sq Ft row. \$46 should be charged for each car the garage is designed to accommodate. Since the house in this example has a 2-car garage, multiply the amount shown for one car (\$46) times 2 to reflect the value of a 2-car garage ( $2 \times \$46 = \$92$ ). Add \$92 to the rent.



The sixth adjustment is made for the fireplace. Follow the column headed “**Fireplace**” down to the 1,200 Sq Ft row. The amount reflects an addition of \$20 for one or more fireplaces. Add \$20 to the rent for the fireplace.

The final adjustment is the community adjustment. The house in this example is located near Pipestone, MN. The notes beneath the table (see “**Community Adjustments**”) reflect that Pipestone, MN receives an adjustment of -\$212. As instructed, subtract \$212 from the rent. Community adjustments are given only to communities in which the market rents are **lower** than the regional average level of rents. Communities not listed in the tables have rents which are equal to or higher than the regional average rent, and do not receive community adjustments.

In summary, the adjustments that produce the Monthly Base Rental Rate for the house used in this example are shown below.

Chart Rent (1,200 Sq Ft/35 Yrs Old) .....	\$575.00
Extra Bath Adjustment (.5 X \$77).....	+ 39.00
Fair Exterior Condition Adjustment.....	- 10.00
Fair Interior Condition Adjustment.....	- 10.00
Central Air Conditioning Adjustment.....	+ 31.00
Garage Adjustment (2 Car X \$46).....	+ 92.00
Fireplace Adjustment .....	+ 20.00
Community Adjustment (Pipestone, MN) .....	<u>- 212.00</u>
Monthly Base Rent.....	\$525.00
Monthly Base Rent (Rounded to nearest \$1) .....	\$525.00

The last step is to round the resulting MBRR (Monthly Base Rental Rate) to the nearest whole dollar. Any amount resulting in an amount of \$.50 or greater is rounded up; any amount resulting in an amount of \$.49 or less is rounded down. The decision to round is discretionary.





**TABLE 3C MONTHLY BASE RENT CHART - GOOD CONDITION, 2 BEDROOM, 1 BATH HOUSES  
NORTH CENTRAL REGION**

Sq Ft	5 yrs old	15 yrs old	25 yrs old	35 yrs old	45 yrs old	55 yrs old	75+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*	Refrig Air Cond	Garage (Per Car)	Fire-place	Plex
300	\$547	\$506	\$485	\$471	\$460	\$451	\$437	+\$19	+\$34	-\$10	-\$15	+\$8	+\$46	+\$20	-\$20
400	\$554	\$513	\$491	\$477	\$466	\$457	\$443	+\$26	+\$34	-\$10	-\$15	+\$10	+\$46	+\$20	-\$26
500	\$560	\$519	\$498	\$483	\$472	\$464	\$450	+\$32	+\$34	-\$10	-\$15	+\$13	+\$46	+\$20	-\$33
600	\$566	\$526	\$504	\$490	\$479	\$470	\$456	+\$38	+\$34	-\$10	-\$15	+\$16	+\$46	+\$20	-\$40
700	\$573	\$532	\$511	\$496	\$485	\$476	\$462	+\$45	+\$34	-\$10	-\$15	+\$18	+\$46	+\$20	-\$46
800	\$579	\$538	\$517	\$503	\$492	\$483	\$469	+\$51	+\$34	-\$10	-\$15	+\$21	+\$46	+\$20	-\$53
900	\$586	\$545	\$523	\$509	\$498	\$489	\$475	+\$58	+\$34	-\$10	-\$15	+\$23	+\$46	+\$20	-\$59
1,000	\$592	\$551	\$530	\$515	\$504	\$496	\$482	+\$64	+\$34	-\$10	-\$15	+\$26	+\$46	+\$20	-\$66
1,100	\$598	\$558	\$536	\$522	\$511	\$502	\$488	+\$70	+\$34	-\$10	-\$15	+\$29	+\$46	+\$20	-\$73
1,200	\$605	\$564	\$543	\$528	\$517	\$508	\$494	+\$77	+\$34	-\$10	-\$15	+\$31	+\$46	+\$20	-\$79
1,300	\$611	\$570	\$549	\$535	\$524	\$515	\$501	+\$83	+\$34	-\$10	-\$15	+\$34	+\$46	+\$20	-\$86
1,400	\$618	\$577	\$555	\$541	\$530	\$521	\$507	+\$90	+\$34	-\$10	-\$15	+\$36	+\$46	+\$20	-\$92
1,500	\$624	\$583	\$562	\$547	\$536	\$528	\$514	+\$96	+\$34	-\$10	-\$15	+\$39	+\$46	+\$20	-\$99
1,600	\$630	\$590	\$568	\$554	\$543	\$534	\$520	+\$102	+\$34	-\$10	-\$15	+\$42	+\$46	+\$20	-\$106
1,700	\$637	\$596	\$575	\$560	\$549	\$540	\$526	+\$109	+\$34	-\$10	-\$15	+\$44	+\$46	+\$20	-\$112
1,800	\$643	\$602	\$581	\$567	\$556	\$547	\$533	+\$115	+\$34	-\$10	-\$15	+\$47	+\$46	+\$20	-\$119
1,900	\$650	\$609	\$587	\$573	\$562	\$553	\$539	+\$122	+\$34	-\$10	-\$15	+\$49	+\$46	+\$20	-\$125

**Additional Adjustments:**

Carport (Any Size) +\$20 Central Evaporative Air +\$15

**Community Adjustments:**

Knoxville, IA	-\$131	Aurora, MN	-\$74
Missouri Valley, IA	-\$43	International Falls, MN	-\$128
		Pipestone, MN	-\$212
Danville, IL	-\$38	Roseau, MN	-\$73
Harrisburg, IL	-\$235	Thief River Falls, MN	-\$143
Havana, IL	-\$202	Virginia, MN	-\$124
Jonesboro, IL	-\$191		
Marion, IL	-\$74	Bloomfield, MO	-\$199
		Brookfield, MO	-\$227
Dale, IN	-\$155	Doniphan, MO	-\$229
Fort Wayne, IN	-\$25	Mountain View, MO	-\$276
Marion, IN	-\$99	Potosi, MO	-\$213
		Salem, MO	-\$247
Gladstone, MI	-\$42		
Grayling, MI	-\$75	Falls City, NE	-\$340
Houghton, MI	-\$87		
Iron Mountain, MI	-\$159	Akron, OH	-\$54
Iron River, MI	-\$60	Chillicothe, OH	-\$37
Manistee, MI	-\$18	Coshocton, OH	-\$159
Manistique, MI	-\$157	Oak Harbor, OH	-\$27
Munising, MI	-\$92		
Newberry, MI	-\$56	Crandon, WI	-\$128
Ontonagon, MI	-\$87	Viroqua, WI	-\$83
Reed City, MI	-\$105	Washburn, WI	-\$41
Saginaw, MI	-\$29		

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.



## C. APARTMENTS

For all apartment units, use the rental chart which appropriately describes the housing class and the number of bedrooms of the subject unit. The charts for apartments are in Tables 4a through 4d.

Assume a 2-bedroom, 2-bathroom apartment, near Minneapolis, Minnesota, with 760 square feet. The exterior is in poor condition; the interior is in fair condition. The apartment, which was built in 1963, is 44 years old (2007-1963), has a carport, and central evaporative cooling.

First, the two-bedroom chart for good condition apartments (Table 4b) should be located and used. These charts are baseline charts, which assume that each apartment is in “good” condition inside and outside, and has one full bathroom. Therefore, if the apartment is in “good” condition inside and outside and has one bathroom, no additional computations are needed. If there is a deviation from either “good” inside or outside condition, or there are less or more bathrooms than one, then the computations must be changed as discussed below. In the first step, Table 4b is selected as the proper chart for 2-bedroom apartments.

In the second step, the size (gross living area) is rounded **down** from 760 to 700 square feet. Under the column headed “**Sq Ft**,” the figure 700 should be located. All further adjustments will be taken from this row.

In the third step the appropriate age column is selected. A 44-year-old apartment is between 35 and 45 years old; therefore, the “**45 yrs old**” column should be used. A two-bedroom apartment, in good condition with 700 square feet of living space (gross), and which is 45 years of age, has a “Chart Rent” of \$461 per month.

The first adjustment is the extra bathroom adjustment charge. Following the 700 Sq Ft row along to the column headed “**Per Extra Bath**” you will find a charge of \$54. To compute the charge for the extra bathroom, multiply 1 (1 extra bath) times \$54 (the extra bath charge). Add \$54 to the rent.

The second and third adjustments are for a poor exterior and a fair interior condition. Follow the 700 Sq Ft row across the table to the column headed “**Poor Exterior/Interior\***” a deduction of -\$15 is shown; and in the next column titled “**Fair Exterior/Interior\***”, a deduction of -\$10 is shown. Subtract \$15 for poor exterior condition, and \$10 for fair interior condition.

The fourth adjustment is for a carport. Beneath the table, under “**Additional Adjustments**”, there is an instruction to add \$10 for a carport of any size. As instructed, add \$10 to the rent of this apartment.

The fifth adjustment is for the central evaporative cooling system. Beneath the table, under “**Additional Adjustments**”, there is an instruction to add \$10 for Central Evaporative Air.

The final adjustment is the community adjustment. The apartment in this example is located near Minneapolis, MN. The notes beneath the table (see “**Community Adjustments**”) show no adjustment for Minneapolis, MN. Therefore, rental values in Minneapolis for apartments are equal to or greater than the regional average. Since positive community adjustments are not applied, no community adjustment is shown for Minneapolis.

In summary, the Monthly Base Rental Rate for the apartment in this example is determined as follows:

Chart Rent (700 Sq Ft/45 yrs old) .....	\$461.00
Extra Bath Adjustment (1 X \$54).....	+ 54.00
Poor Exterior Adjustment.....	- 15.00
Fair Interior Adjustment.....	- 10.00
Carport Adjustment.....	+10.00
Central Evaporative Cooling Adjustment.....	+10.00
Location Adjustment (Minneapolis, MN) .....	<u>- 0.00</u>
Monthly Base Rental Rate.....	\$510.00
Monthly Base Rental Rate (Rounded to nearest \$1) .....	\$510.00

The last step is to round the resulting MBRR (Monthly Base Rental Rate) to the nearest whole dollar. Any amount resulting in an amount of \$.50 or greater is rounded up; any amount resulting in an amount of \$.49 or less is rounded down. The decision to round is discretionary.

**TABLE 4A MONTHLY BASE RENT CHART - GOOD CONDITION, 3 BEDROOM, 1 BATH APARTMENTS  
NORTH CENTRAL REGION**

Sq Ft	5 yrs old	15 yrs old	25 yrs old	35 yrs old	45 yrs old	55 yrs old	75+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*	Garage	Refrig Air Cond
600	\$553	\$536	\$518	\$501	\$484	\$466	\$432	+\$46	+\$15	-\$10	-\$15	+\$20	+\$20
700	\$573	\$555	\$538	\$521	\$503	\$486	\$451	+\$54	+\$15	-\$10	-\$15	+\$20	+\$20
800	\$592	\$575	\$558	\$540	\$523	\$506	\$471	+\$62	+\$15	-\$10	-\$15	+\$20	+\$20
900	\$612	\$594	\$577	\$560	\$543	\$525	\$491	+\$69	+\$15	-\$10	-\$15	+\$20	+\$20
1,000	\$631	\$614	\$597	\$579	\$562	\$545	\$510	+\$77	+\$15	-\$10	-\$15	+\$20	+\$20
1,100	\$651	\$634	\$616	\$599	\$582	\$564	\$530	+\$85	+\$15	-\$10	-\$15	+\$20	+\$20
1,200	\$671	\$653	\$636	\$619	\$601	\$584	\$549	+\$92	+\$15	-\$10	-\$15	+\$20	+\$20
1,300	\$690	\$673	\$656	\$638	\$621	\$604	\$569	+\$100	+\$15	-\$10	-\$15	+\$20	+\$20
1,400	\$710	\$692	\$675	\$658	\$641	\$623	\$589	+\$108	+\$15	-\$10	-\$15	+\$20	+\$20
1,500	\$729	\$712	\$695	\$677	\$660	\$643	\$608	+\$116	+\$15	-\$10	-\$15	+\$20	+\$20
1,600	\$749	\$732	\$714	\$697	\$680	\$662	\$628	+\$123	+\$15	-\$10	-\$15	+\$20	+\$20
1,700	\$769	\$751	\$734	\$717	\$699	\$682	\$647	+\$131	+\$15	-\$10	-\$15	+\$20	+\$20
1,800	\$788	\$771	\$754	\$736	\$719	\$702	\$667	+\$139	+\$15	-\$10	-\$15	+\$20	+\$20

**Additional Adjustments:**

Carport (Any Size)	+\$10	Central Evaporative Air	+\$10
Fireplace(s)	+\$10		

**Community Adjustments:**

Knoxville, IA	-\$68	Doniphan, MO	-\$205
Fort Wayne, IN	-\$108	Joplin, MO	-\$114
Houghton, MI	-\$83	Port Clinton, OH	-\$30
Saginaw, MI	-\$29	Tomah, WI	-\$72

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.



**TABLE 4B MONTHLY BASE RENT CHART - GOOD CONDITION, 2 BEDROOM, 1 BATH APARTMENTS  
NORTH CENTRAL REGION**

Sq Ft	5 yrs old	15 yrs old	25 yrs old	35 yrs old	45 yrs old	55 yrs old	75+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*	Garage	Refrig Air Cond
400	\$472	\$454	\$437	\$420	\$403	\$385	\$351	+\$31	+\$15	-\$10	-\$15	+\$20	+\$20
500	\$491	\$474	\$457	\$439	\$422	\$405	\$370	+\$39	+\$15	-\$10	-\$15	+\$20	+\$20
600	\$511	\$494	\$476	\$459	\$442	\$424	\$390	+\$46	+\$15	-\$10	-\$15	+\$20	+\$20
700	\$531	\$513	\$496	\$479	\$461	\$444	\$409	+\$54	+\$15	-\$10	-\$15	+\$20	+\$20
800	\$550	\$533	\$516	\$498	\$481	\$464	\$429	+\$62	+\$15	-\$10	-\$15	+\$20	+\$20
900	\$570	\$552	\$535	\$518	\$501	\$483	\$449	+\$69	+\$15	-\$10	-\$15	+\$20	+\$20
1,000	\$589	\$572	\$555	\$537	\$520	\$503	\$468	+\$77	+\$15	-\$10	-\$15	+\$20	+\$20
1,100	\$609	\$592	\$574	\$557	\$540	\$522	\$488	+\$85	+\$15	-\$10	-\$15	+\$20	+\$20
1,200	\$629	\$611	\$594	\$577	\$559	\$542	\$507	+\$92	+\$15	-\$10	-\$15	+\$20	+\$20
1,300	\$648	\$631	\$614	\$596	\$579	\$562	\$527	+\$100	+\$15	-\$10	-\$15	+\$20	+\$20
1,400	\$668	\$650	\$633	\$616	\$599	\$581	\$547	+\$108	+\$15	-\$10	-\$15	+\$20	+\$20
1,500	\$687	\$670	\$653	\$635	\$618	\$601	\$566	+\$116	+\$15	-\$10	-\$15	+\$20	+\$20
1,600	\$707	\$690	\$672	\$655	\$638	\$620	\$586	+\$123	+\$15	-\$10	-\$15	+\$20	+\$20

**Additional Adjustments:**

Carport (Any Size)	+\$10	Central Evaporative Air	+\$10
Fireplace(s)	+\$10		

**Community Adjustments:**

Knoxville, IA	-\$68	Doniphan, MO	-\$205
Fort Wayne, IN	-\$108	Joplin, MO	-\$114
Houghton, MI	-\$83	Port Clinton, OH	-\$30
Saginaw, MI	-\$29	Tomah, WI	-\$72

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.

**TABLE 4C MONTHLY BASE RENT CHART - GOOD CONDITION, 1 BEDROOM, 1 BATH APARTMENTS  
NORTH CENTRAL REGION**

Sq Ft	5 yrs old	15 yrs old	25 yrs old	35 yrs old	45 yrs old	55 yrs old	75+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*	Garage	Refrig Air Cond
300	\$410	\$393	\$376	\$358	\$341	\$324	\$289	+\$23	+\$15	-\$10	-\$15	+\$20	+\$20
400	\$430	\$412	\$395	\$378	\$361	\$343	\$309	+\$31	+\$15	-\$10	-\$15	+\$20	+\$20
500	\$449	\$432	\$415	\$397	\$380	\$363	\$328	+\$39	+\$15	-\$10	-\$15	+\$20	+\$20
600	\$469	\$452	\$434	\$417	\$400	\$382	\$348	+\$46	+\$15	-\$10	-\$15	+\$20	+\$20
700	\$489	\$471	\$454	\$437	\$419	\$402	\$367	+\$54	+\$15	-\$10	-\$15	+\$20	+\$20
800	\$508	\$491	\$474	\$456	\$439	\$422	\$387	+\$62	+\$15	-\$10	-\$15	+\$20	+\$20
900	\$528	\$510	\$493	\$476	\$459	\$441	\$407	+\$69	+\$15	-\$10	-\$15	+\$20	+\$20
1,000	\$547	\$530	\$513	\$495	\$478	\$461	\$426	+\$77	+\$15	-\$10	-\$15	+\$20	+\$20
1,100	\$567	\$550	\$532	\$515	\$498	\$480	\$446	+\$85	+\$15	-\$10	-\$15	+\$20	+\$20
1,200	\$587	\$569	\$552	\$535	\$517	\$500	\$465	+\$92	+\$15	-\$10	-\$15	+\$20	+\$20
1,300	\$606	\$589	\$572	\$554	\$537	\$520	\$485	+\$100	+\$15	-\$10	-\$15	+\$20	+\$20
1,400	\$626	\$608	\$591	\$574	\$557	\$539	\$505	+\$108	+\$15	-\$10	-\$15	+\$20	+\$20
1,500	\$645	\$628	\$611	\$593	\$576	\$559	\$524	+\$116	+\$15	-\$10	-\$15	+\$20	+\$20

**Additional Adjustments:**

Carport (Any Size)	+\$10	Central Evaporative Air	+\$10
Fireplace(s)	+\$10		

**Community Adjustments:**

Knoxville, IA	-\$68	Doniphan, MO	-\$205
Fort Wayne, IN	-\$108	Joplin, MO	-\$114
Houghton, MI	-\$83	Port Clinton, OH	-\$30
Saginaw, MI	-\$29	Tomah, WI	-\$72

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.

**TABLE 4D MONTHLY BASE RENT CHART - GOOD CONDITION, 0 BEDROOM, 1 BATH APARTMENTS  
NORTH CENTRAL REGION**

Sq Ft	5 yrs old	15 yrs old	25 yrs old	35 yrs old	45 yrs old	55 yrs old	75+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*	Garage	Refrig Air Cond
100	\$329	\$312	\$294	\$277	\$260	\$242	\$208	+\$10	+\$15	-\$10	-\$15	+\$20	+\$20
200	\$349	\$331	\$314	\$297	\$279	\$262	\$227	+\$15	+\$15	-\$10	-\$15	+\$20	+\$20
300	\$368	\$351	\$334	\$316	\$299	\$282	\$247	+\$23	+\$15	-\$10	-\$15	+\$20	+\$20
400	\$388	\$370	\$353	\$336	\$319	\$301	\$267	+\$31	+\$15	-\$10	-\$15	+\$20	+\$20
500	\$407	\$390	\$373	\$355	\$338	\$321	\$286	+\$39	+\$15	-\$10	-\$15	+\$20	+\$20
600	\$427	\$410	\$392	\$375	\$358	\$340	\$306	+\$46	+\$15	-\$10	-\$15	+\$20	+\$20
700	\$447	\$429	\$412	\$395	\$377	\$360	\$325	+\$54	+\$15	-\$10	-\$15	+\$20	+\$20
800	\$466	\$449	\$432	\$414	\$397	\$380	\$345	+\$62	+\$15	-\$10	-\$15	+\$20	+\$20
900	\$486	\$468	\$451	\$434	\$417	\$399	\$365	+\$69	+\$15	-\$10	-\$15	+\$20	+\$20
1,000	\$505	\$488	\$471	\$453	\$436	\$419	\$384	+\$77	+\$15	-\$10	-\$15	+\$20	+\$20
1,100	\$525	\$508	\$490	\$473	\$456	\$438	\$404	+\$85	+\$15	-\$10	-\$15	+\$20	+\$20

**Additional Adjustments:**

Carport (Any Size)	+\$10	Central Evaporative Air	+\$10
Fireplace(s)	+\$10		

**Community Adjustments:**

Knoxville, IA	-\$68	Doniphan, MO	-\$205
Fort Wayne, IN	-\$108	Joplin, MO	-\$114
Houghton, MI	-\$83	Port Clinton, OH	-\$30
Saginaw, MI	-\$29	Tomah, WI	-\$72

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.

D. MOBILE HOMES, TRAVEL TRAILERS, AND HOUSEBOATS

For these housing classes, use the mobile home base rental chart (Tables 5a). To familiarize the reader with this chart, assume a 390 square foot, 1-bedroom mobile home built in 1973 with a ¾ bathroom. This mobile home is in poor interior and poor exterior condition and is located near Crandon, Wisconsin. The Monthly Base Rental Rate for the mobile home in this example is calculated from Table 5a as follows.

The chart for good condition mobile homes (Table 5a) should be located and used. This chart is a baseline chart for any number of bedrooms, and assumes that each mobile home is in “good” condition inside and outside and has one full bathroom. Therefore, if the mobile home is in “good” condition inside and outside and has one full bathroom, no additional computations are needed. If there is a deviation from either “good” inside or outside condition, or there are less or more bathrooms than one, then the computations must be changed accordingly.

First, locate Table 5a. Next, the gross **square feet** of living area should be rounded **down** to 300 square feet, and the **age** (2007-1973 = 34 years) is rounded **up** to 35+ years. The column headed “**Sq Ft**” is followed down to 300. All other adjustments are taken from this row. On this row, under the column headed “**35+ yrs old,**” the “Chart Rent” is \$268.

The base rental value of \$268 (“chart rent”) includes the value of one full bathroom. Since the unit in this example has only a ¾ bathroom, an adjustment must be made for the missing ¼ bathroom. At the top of the table is a column titled “**Per Extra Bath.**” Follow this column down to the 300 Sq Ft row. A value of \$10 is shown. Multiply this value times .25 (¼ bathroom) to calculate the value of the missing ¼ bathroom (\$10 X .25 = \$2.50). Subtract -\$3.00 (rounded) from the rent.

The second and third adjustments are for the condition of the unit. Follow the 300 Sq Ft row to the column headed “**Poor Exterior/Interior\***”; subtract -\$15 for the poor exterior condition and another -\$15 for the poor interior condition.

The final adjustment is the community adjustment. The mobile home in this example is located near Crandon, WI. The notes beneath the table (see “**Community Adjustments**”) show an adjustment of -\$48 for Crandon, WI. The rental values for mobile homes in Crandon, WI are much lower than the survey area average. The rent for mobile homes which use Crandon as the nearest established community should be reduced by -\$48.

The Monthly Base Rental Rate for this mobile home is shown below.

Chart Rent (300 Sq Ft/35+ Yrs Old) .....	\$268.00
Bathroom Adjustment (.25 X \$10, rounded) .....	- 3.00
Poor Exterior .....	- 15.00
Poor Interior .....	- 15.00
Location Adjustment (Crandon, WI) .....	<u>-48.00</u>

Computed Monthly Base Rental Rate.....	\$187.00
Actual Monthly Base Rental Rate (Minimum Base applies) .....	\$190.00

Note: In this example, the Monthly Base Rental Rate computes to \$187.00, which is less than the \$190.00 minimum Monthly Base Rental Rate for the North Central Survey Region (refer to the footnotes on each rent table for the minimum base rent). Therefore, the Monthly Base Rental Rate for the mobile home in this example will be set at \$190.00. Keep in mind that the *Monthly Base Rental Rate* is different from the minimum monthly *final rent*. Thus, \$190.00 is not the minimum final rent possible.

**TABLE 5A MONTHLY BASE RENT CHART - GOOD CONDITION, ANY BEDROOMS, 1 BATH MOBILE HOMES**  
NORTH CENTRAL REGION

Sq Ft	5 yrs old	10 yrs old	15 yrs old	20 yrs old	25 yrs old	30 yrs old	35+ yrs old	Per Extra Bath	Excel Interior / Exterior*	Fair Interior / Exterior*	Poor Interior / Exterior*
100	\$237	\$231	\$225	\$220	\$214	\$208	\$202	+\$10	+\$10	-\$12	-\$15
200	\$270	\$264	\$258	\$253	\$247	\$241	\$235	+\$10	+\$10	-\$12	-\$15
300	\$303	\$297	\$291	\$286	\$280	\$274	\$268	+\$10	+\$10	-\$12	-\$15
400	\$336	\$330	\$324	\$319	\$313	\$307	\$301	+\$10	+\$10	-\$12	-\$15
500	\$369	\$363	\$357	\$352	\$346	\$340	\$334	+\$10	+\$10	-\$12	-\$15
600	\$402	\$396	\$390	\$385	\$379	\$373	\$367	+\$10	+\$10	-\$12	-\$15
700	\$435	\$429	\$423	\$418	\$412	\$406	\$400	+\$10	+\$10	-\$12	-\$15
800	\$468	\$462	\$456	\$451	\$445	\$439	\$433	+\$10	+\$10	-\$12	-\$15
900	\$501	\$495	\$489	\$484	\$478	\$472	\$466	+\$10	+\$10	-\$12	-\$15
1,000	\$534	\$528	\$522	\$517	\$511	\$505	\$499	+\$10	+\$10	-\$12	-\$15
1,100	\$567	\$561	\$555	\$550	\$544	\$538	\$532	+\$10	+\$10	-\$12	-\$15
1,200	\$600	\$594	\$588	\$583	\$577	\$571	\$565	+\$10	+\$10	-\$12	-\$15
1,300	\$633	\$627	\$621	\$616	\$610	\$604	\$598	+\$10	+\$10	-\$12	-\$15
1,400	\$666	\$660	\$654	\$649	\$643	\$637	\$631	+\$10	+\$10	-\$12	-\$15
1,500	\$699	\$693	\$687	\$682	\$676	\$670	\$664	+\$10	+\$10	-\$12	-\$15
1,600	\$732	\$726	\$720	\$715	\$709	\$703	\$697	+\$10	+\$10	-\$12	-\$15

**Additional Adjustments:**

Garage (Any Size)	+\$15	Central Refrigerated Air Conditioning	+\$35
Carport (Any Size)	+\$10	Central Evaporative Air	+\$20
Fireplace(s)	+\$10		

**Community Adjustments:**

Bemidji, MN	-\$16
McArthur, OH	-\$52
Crandon, WI	-\$48

\*If both the Exterior and Interior are in this condition, apply this factor twice.

Regardless of adjustments, the minimum base rent is \$190 per month.

The appropriate CPI factor should be applied after completing the above adjustments.

## E. CABINS OR LOOKOUTS

For purposes of rental rate establishment, the rental housing class most comparable to cabins or lookouts would be 1-bedroom, single-family houses, regardless of the number of bedrooms in the cabin. One-bedroom, single-family rental houses generally consist of smaller and older housing units. Where the cabins or lookouts are outfitted for housekeeping, and contain an independent primary heating system, the rental rates (including all applicable adjustments) are determined by using the 1-bedroom house chart (Table 3d).

Where a cabin or lookout lacks full housekeeping facilities (including running water, an inside heated bathroom or a central heating system), additional adjustments (shown below) must be made to the Monthly Base Rental Rate. A free-standing stove without a fan or a fireplace does not qualify as a central primary heating system. These adjustments are designed to take into consideration the inconvenience resulting from the lack of full housekeeping facilities. However, the adjusted monthly base rental rate for cabins or lookouts may not be set below the minimum monthly base rent for the North Central Survey Region of \$190.

No Electricity = -20%

No Inside Bathroom = -20%

No Running Water = -20%

No Central Heating System = -15% (applied only if used during the heating season.)

Less Than Two Rooms (One-Room Cabin or Lookout) = -10%

## F. BUNKHOUSE AND DORMITORIES

Bunkhouses and dormitories should only include housing units that have been specifically constructed or modified for use as bunkhouses or dormitories. Single-family houses, apartments or mobile homes that are **used** as dormitories or bunkhouses, must be valued as what they are (houses, apartments or mobile homes), with the rent divided by the number of **planned** occupants.

Dormitory or bunkhouse units typically lack either a living room or kitchen, or have common baths and centralized kitchens (cafeterias, mess halls) serving many people. Many also have multiple bunk beds in large ward-like rooms. Such housing units pose a valuation problem, as they are normally found only in association with institutions such as the military or colleges, of which its occupants are members. Since these institutions do not typically rent to the public at large, one cannot obtain an arms-length “private market” rent.

Under circumstances where there is a lack of comparable rental data, OMB Circular A-45 provides that rental rates may be established using an extension of the Principle of Comparability. Under this procedure, rental rates are established using the most comparable rental housing available, and the rate is essentially 50 percent of the average house rent.

During their 1994 Conference, the National Housing Council decided that one aggregate monthly rate should be established for **all** dormitories in a survey region. This aggregate dormitory rate, which includes the value of government-provided utilities, furnishings and services, was determined as follows. An analysis of the comparables used in this North Central survey found that the average single-family house had 1,346 square feet of finished floor space, 2.7 bedrooms and an average monthly-adjusted contract rent of \$670. By applying an extension of the Principle of Comparability, the Base Shelter Rental Rate (BSRR) for bunkhouses and dormitories is calculated as shown below.

During their 2002 Conference, the National Housing Council reviewed different dormitory costing methods for the newer types of dormitories being built by some agencies. In researching new and existing dormitory models, it was found the majority of the dormitories plan to house two occupants per room, which the current costing methodology is based upon. In addition, most occupants in dormitories share both a kitchen and bathroom. Based on these factors, the Council decided to continue using the current costing methodology.

$$\begin{aligned} &\text{Average adjusted contract rent} / 2 = \$670 / 2 = \$335 \\ &\$335 / (\text{average \# of bedrooms} \times 2 \text{ occupants per bedroom}) \\ &\$335 / (2.7 \text{ bedrooms} \times 2 \text{ occupants}) = \$335 / 5.4 = \$62.04 \text{ per month per occupant} \end{aligned}$$

Charges were then added to this rate for utilities, services and furnishings that are provided by the government. The aggregate value of these items was based on a study of the rates prevailing in the North Central regional survey area. These charges were prorated based upon a 1,346 square foot, 2.7 bedroom, single-family house occupied by 2 people per bedroom. The aggregate charge for these utilities, services and furnishings was \$55.59.

Monthly, weekly, and daily bunkhouse and dormitory rates are computed as follows.





**TABLE 6      BUNKHOUSE/DORMITORY RENTS**  
**NORTH CENTRAL REGION**

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Monthly Charge

Dormitory Base Shelter Rent Rate (BSRR) .....	\$62.04
Related Facilities Charges .....	<u>\$55.59</u>
 Monthly Base Rental Rate (MBRR, rounded to nearest five cents) .....	 \$117.65

Bi-Weekly Charge

To convert to bi-weekly rate, multiply MBRR by .4615 and round to nearest five cents .....	\$54.30
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Weekly Charge

To convert to weekly rate, multiply MBRR by .2308 and round to nearest five cents .....	\$27.15
--	---------

Daily Charge

To convert to daily rate, multiply MBRR by .0333 and round to nearest five cents .....	\$3.90
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An administrative adjustment of –10% is permitted for dormitories if 3 or more people must share a bedroom or sleeping area. Also, an administrative adjustment of –10% is permitted for dormitories that lack a kitchen or cooking facilities.

NOTE: For current dormitory rates in this region, see the annual “CPI Memorandum,” issued each November by the QMIS Office.

G. TRANSIENT RENTS

Transient units are those that are occupied on a transient basis, normally for a period of 90 days or less. Government-provided transient housing units offer a range of accommodations. At some locations, kitchen facilities, private telephones and private bathrooms may be available; at others, they are not provided. At some locations, maid service is provided (with varying degrees of frequency); at other locations, employees are “issued” bedding and other domestic items, and must take care of their own housekeeping arrangements.

Given the diversity of facilities and services associated with government-provided transient units, the National Housing Council determined that private housing comparable to government transient units generally does not exist. Accordingly, the rental charges for transient units have been established by extending the principle of comparability, as provided in OMB Circular A-45.

Essentially, the rental charge for transient units is the sum of the monthly dormitory rate plus related facilities, a monthly charge for maid service (Table 18), and a 20 percent administrative/service charge required by OMB Circular A-45 paragraph 7.c (4)(a). Monthly, weekly and daily charges for transients are shown, below, in Table 7.

**TABLE 7      TRANSIENT RENTS**  
NORTH CENTRAL REGION

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Dormitory BSRR .....	\$62.04
Related Facilities Charges .....	55.59
Maid Service (Table 18) .....	<u>78.05</u>
Subtotal .....	\$195.68
Administrative Charge +20% (OMB Cir. A-45) .....	<u>x 1.20</u>
Transient MBRR (rounded to nearest five cents).....	\$234.80
Monthly Charge .....	\$234.80
Bi-Weekly Charge (\$234.80 x .4615 Rounded) .....	\$108.35
Weekly Charge (\$234.80 x .2308 Rounded) .....	\$54.20
Daily Charge (\$234.80 x .0333 Rounded).....	\$7.80

NOTE: For current Transient rates in this region, see the annual “CPI Memorandum,” issued each November by the QMIS Office.

## H. TRAILER PADS

During the North Central survey, trailer pads were surveyed in a variety of mobile home parks. They differed in physical characteristics, utilities, rents, and geographical location.

A simplified analysis of this data was done. The value of related facilities in the contract rent was subtracted to arrive at an adjusted rent. After excluding extreme outliers, the average adjusted rent was determined for the remaining samples.

The average adjusted rent was then divided into the actual rent of each remaining sample. Those communities where the adjusted contract rents were significantly lower than the average rent for the region were adjusted to the community average trailer pad rents. As with houses, apartments and mobile homes, those trailer pads in high-cost areas are “capped” at the average trailer pad rent for the survey region.

During their 1993 Conference, the National Housing Council agreed to assess the monthly base rental rate for single-wide trailer pads for **all** government-furnished trailer pads. This is because most employees do not own/occupy doublewide mobile homes, and because the market differences are negligible.

To determine the trailer pad Monthly Base Rental Rate, use the applicable rate contained in Table 8. Do not use the rates in Table 8 if the trailer pad is occupied by a government-owned or -leased mobile home; this would be a “trailer” or “mobile home” rent class and the “space rent” is already included in the base rent calculation for these units. Rates in Table 8 are used if a tenant-owned trailer or recreational vehicle is parked on a government-owned trailer space.

For example, if a trailer pad were occupied by a tenant-owned mobile home located near Washburn, Wisconsin, the base rent for this pad would be \$136 per month. If, for another example, the trailer space were located near Silver Bay, Minnesota, the base rental rate for this pad would be \$145 (the “All Other Locations” charge). No other adjustments are made for physical characteristics, such as the date the trailer pad was installed, the front or square footage, or the total number of sites at that location.

However, all appropriate administrative adjustments (such as amenity and isolation adjustments), as well as all charges for government-provided related facilities (such as utilities and furnishings) should be applied to the Monthly Base Rental Rates in Table 8 to determine the monthly net rental charge.

**TABLE 8      TRAILER PADS - MONTHLY BASE RENTAL RATES**  
NORTH CENTRAL REGION

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<u>COMMUNITIES</u>	<u>MONTHLY BASE RENTAL RATES</u>
MINNESOTA	
International Falls	\$123
WISCONSIN	
Washburn	\$136
<b>ALL OTHER LOCATIONS</b>	<b>\$145</b>

## I. OBSOLETE HOUSING UNITS

OMB Circular A-45 (revised October 20, 1993) excludes from the term rental units "...housing which due to extreme deterioration is unsuitable for occupancy except in exigent circumstances. ..." The net effect of this change means there will be no base rental rate for obsolete units. However, assessments will be made for utilities, furnishings, appliances, and any other services that are provided by the government.

The Department of the Interior Quarters Handbook: Department Manual 400 (DM 400) and the regulations of other QMIS Program participants require that housing used for employees must be safe, sanitary, and energy efficient. Where housing is in obsolete condition, it is by definition unfit for use as employee housing, and should be renovated, replaced, destroyed or used for non-residential purposes. Section 7.3A of DM 400 also provides that the appropriate Program Assistant Secretary, or his/her designee (Bureau Head), may authorize temporary occupancy, for a period not to exceed one year, pending a rehabilitation or replacement action where sufficient written justification is provided.

## VI. CHARGES FOR UTILITIES, APPLIANCES AND RELATED SERVICES

### A. BACKGROUND

OMB Circular A-45 requires that, whenever possible, utilities should be provided by a private company and billed directly to housing occupants. Where government-furnished utilities are provided, they should be metered or measured. When government-furnished utilities are not metered or measured, consumption will be determined from an analysis of the average amounts of utilities used in comparable private housing in the nearest established community or survey area. **Where the government furnishes utilities, and where the housing rental rates are established by the regional survey method, the utility rates shall be the regional average utility rates prescribed in this report – not the rates prevailing in the nearest established community.**

The regional average utility rates contained in this report include all applicable delivery charges, adjustments, taxes and surcharges. Charges for government-provided appliances, services and furnishings (those in Table 18) are based upon nationwide average costs.

The following sections of this report detail the consumption and cost data to be used in the circumstances described above. The cost data in this report will be updated by the QMIS Office each year and distributed with the Consumer Price Index (CPI) adjustment that takes effect each year. See the “CPI Memorandum” distributed annually in November for current utility rates in this region.

### B. ENERGY CONSUMPTION STUDY

1. **General.** Energy consumption estimates are required where the government furnishes the space heating or cooling fuel and the electricity, and where consumption is neither metered nor measured. In such instances, average energy consumption must be estimated and the government must assess a charge based on private sector energy costs in the survey area. No methodology for estimating energy consumption can exactly predict the amounts of energy needed to heat or cool specific dwellings. Precise consumption measurements are possible only when metering is used. However, the methodology used in this report will yield **reasonable** estimates of the heating and cooling energy consumption requirements of unmetered dwellings. The methodology employed in this section was developed by a contractor. For this report, however, the contractor-provided tables and conversion charts have been reformatted, and the methodology has been re-stated, to simplify the process of estimating energy consumption requirements. The unit costs for various fuel types and for electricity (e.g., the cost per gallon for fuel oil and propane; the cost per MCF (1,000 cubic feet) for natural gas; and the cost per Kwh for electricity) are regional averages of the unit fuel/electricity prices gathered in each community surveyed for rental comparables.
2. **Housing Prototypes.** For the North Central energy study, estimates of the heating and cooling energy requirements were prepared for each of the following six prototypical housing units.

**Type I** – Single family, one story, no basement

**Type II** – Single family, one story, full basement

**Type III** – Single family, two story, no basement

**Type IV** – Single family, two story, full basement

**Type V** – Apartment unit

**Type VI** – Mobile Home

3. **Assumptions.** For each of the housing prototypes, the following assumptions were made:
- a. Location – The housing is located in Springfield, Illinois (the Baseline City.)
  - b. R values – Each housing type has the R values of insulation in floors, walls, and ceilings recommended in the HUD Minimum Property Standards (HUD-MPS) for the Springfield, IL area.
  - c. Occupants – The housing contains an average compliment of occupants who are energy conscious (one person per 500 feet of floor space was assumed).
  - d. All measurements are of finished living space only and are based upon exterior dimensions.
  - e. Condition – The housing is in good condition.
  - f. Building shape – A rectangular shape with a ratio of 2:1 was established. This provides more building skin than a square configuration therefore; the rectangular shape yields a conservative estimate of skin loads.
  - g. Window area – A window area of 10 percent of wall area was used to match UBC (Uniform Building Code) minimum window area standards.
  - h. Roof type – A flat or pitched roof with ceiling insulation was assumed in all cases.
  - i. Air changes – 1.5 air changes per hour were established as representing a conservative estimate of air changes in residential applications.
  - j. Perimeter loss – Approximately 10 percent of overall building load is attributed to the slab on grade floors with rigid insulation to a value of R-6.
4. Using the above assumptions, infiltration factors developed by the Department of Energy, R values, building dimensions, and cooling and heating degree days, a contractor has formulated methodologies for estimating British Thermal Unit (BTU) and kilowatt hour (KwH) consumption rates and costs for heating and cooling. The relevant portions of the methodology are explained below.

### C. SPACE HEATING (FOSSIL FUEL) CONSUMPTION/COST CALCULATIONS

To illustrate the procedure for calculating the cost of heating with fossil fuel, a single story 1,850 square foot house, with no basement, located near Chesterton, Indiana will be used as an example.

1. The first step is to select from among Tables 9a through 9f the table that most closely describes the unit at issue. In this case, Table 9a is for a 1-story single-family house with a partial (50 percent or

less) or no basement (Prototype I). When determining the prototype, use the total basement (finished and unfinished) square footage. Unfinished space is only considered when determining the prototype. It is never used when using a rent setting or consumption chart. Table 9a should be selected in this example.

2. The second step is to determine the number of BTUs consumed **annually** for heating the house used in this example. Select from Table 9a the annual MBTU (million BTUs) consumption appropriate for the heating degree days (HDDs) and the gross **finished** square footage of the house in this example. Use the table as shown below.
  - a. Find the number of HDDs for the established community near which the housing units are located. Table 10 contains the HDDs for the nearest established communities in the North Central survey region; this table shows that Chesterton, IN has 6,456 HDDs. In Table 9a, 6,456 HDDs lies between the columns headed “**6,000**” and “**6,500**.” Round 6,456 HDDs down to 6,000 HDDs.
  - b. In Table 9a, 1,850 square feet (the size of the house used in the example) lies between 1,800 and 2,000 square feet; round 1,850 down to 1,800 square feet.
  - c. From Table 9a (1,800 square feet and 6,000 HDDs) the annual MBTU consumption rate is 84.6 MBTUs.
3. The third step is to calculate the amount of fossil fuel needed to produce 84.6 MBTUs. Table 11 shows the amount of fossil fuel needed to produce 1 MBTU. The total amount of heating fuel required to produce 84.6 MBTUs is computed by multiplying the appropriate fuel factor in Table 11 by the number of MBTUs. In this case the fuel required is:

<b>Natural gas:</b>	84.6 MBTUs x 1 MCF	=	84.6 MCF
<b>Propane:</b>	84.6 MBTUs x 10.2 gallons	=	862.92 gallons
<b>Fuel oil:</b>	84.6 MBTUs x 7.04 gallons	=	595.58 gallons

4. The fourth step is to calculate the annual cost of the fuel consumed. This can be done by multiplying the annual fuel consumption by the unit fuel charges shown in Table 12. Following this procedure, the charge for fuel consumed annually to produce 84.6 MBTUs is:

<b>Natural gas:</b>	84.6 MCF x \$12.72 (per MCF)	=	\$1,076.11 annually
<b>Propane:</b>	862.92 gallons x \$1.68 (per gallon)	=	\$1,449.71 annually
<b>Fuel oil:</b>	595.58 gallons x \$2.62 (per gallon)	=	\$1,560.42 annually

5. The fifth step is to calculate the monthly charge for fossil heating fuel. This is done simply by dividing the annual charges (above) by 12 (months). In this manner the monthly charges are: natural gas = \$89.68 monthly; propane = \$120.81 monthly; and fuel oil = \$130.04 monthly.
6. The final step is to multiply the monthly charge (computed in step 5 above) by the appropriate HUD MPS Heating Zone conversion factor (Table 13). In order to use Table 13, it is first necessary to determine the HUD MPS Zone for the community at issue (Chesterton, IN). Table 10 shows the HUD MPS Zones for the nearest established communities located within the North Central survey region. From Table 10, it can be seen that Chesterton, IN is in MPS Zone 7. The conversion factor can now be found in Table 13. The conversion factor for a single story dwelling with no basement



(Prototype I) in HUD MPS Zone 7 is 1.05. Multiply the monthly charges determined in step 5 above by 1.05 (the conversion factor). In this manner, the heating fuel charge can be computed for any housing unit in any community or location. In this example, the final heating costs are \$94.16 ( $\$89.68 \times 1.05$ ) for natural gas, \$126.84 ( $\$120.81 \times 1.05$ ) for propane; and \$136.54 ( $\$130.04 \times 1.05$ ) for fuel oil per month.

The above example pertained to a single story dwelling with a partial (50 percent or less) or no basement. When calculating the heating fuel charge for a different type of housing (including apartments and mobile homes), use the table (Tables 9a through 9f) which most closely describes the housing unit to compute the annual MBTU consumption.

**TABLE 9A ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE I**  
 Single Family, One Story, Partial (Less Than 50%) or No Basement  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**  
**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	2.3	2.7	3.1	3.5	3.9	4.3	4.7	5.1	5.5	5.9	6.3	6.7	7.0	7.4	7.8	8.2
<b>200</b>	4.7	5.5	6.3	7.0	7.8	8.6	9.4	10.2	11.0	11.7	12.5	13.3	14.1	14.9	15.7	16.4
<b>400</b>	9.4	11.0	12.5	14.1	15.7	17.2	18.8	20.4	21.9	23.5	25.1	26.6	28.2	29.8	31.3	32.9
<b>600</b>	14.1	16.4	18.8	21.1	23.5	25.8	28.2	30.5	32.9	35.2	37.6	39.9	42.3	44.6	47.0	49.3
<b>800</b>	18.8	21.9	25.1	28.2	31.3	34.5	37.6	40.7	43.9	47.0	50.1	53.3	56.4	59.5	62.6	65.8
<b>1,000</b>	23.5	27.4	31.3	35.2	39.2	43.1	47.0	50.9	54.8	58.7	62.6	66.6	70.5	74.4	78.3	82.2
<b>1,200</b>	28.2	32.9	37.6	42.3	47.0	51.7	56.4	61.1	65.8	70.5	75.2	79.9	84.6	89.3	94.0	98.7
<b>1,400</b>	32.9	38.4	43.9	49.3	54.8	60.3	65.8	71.3	76.7	82.2	87.7	93.2	98.7	104.2	109.6	115.1
<b>1,600</b>	37.6	43.9	50.1	56.4	62.6	68.9	75.2	81.4	87.7	94.0	100.2	106.5	112.8	119.0	125.3	131.6
<b>1,800</b>	42.3	49.3	56.4	63.4	70.5	77.5	84.6	91.6	98.7	105.7	112.8	119.8	126.9	133.9	141.0	148.0
<b>2,000</b>	47.0	54.8	62.6	70.5	78.3	86.1	94.0	101.8	109.6	117.5	125.3	133.1	141.0	148.8	156.6	164.5
<b>2,200</b>	51.7	60.3	68.9	77.5	86.1	94.8	103.4	112.0	120.6	129.2	137.8	146.4	155.1	163.7	172.3	180.9
<b>2,400</b>	56.4	65.8	75.2	84.6	94.0	103.4	112.8	122.2	131.6	141.0	150.4	159.8	169.2	178.6	187.9	197.3
<b>2,600</b>	61.1	71.3	81.4	91.6	101.8	112.0	122.2	132.3	142.5	152.7	162.9	173.1	183.3	193.4	203.6	213.8
<b>2,800</b>	65.8	76.7	87.7	98.7	109.6	120.6	131.6	142.5	153.5	164.5	175.4	186.4	197.3	208.3	219.3	230.2
<b>3,000</b>	70.5	82.2	94.0	105.7	117.5	129.2	141.0	152.7	164.5	176.2	187.9	199.7	211.4	223.2	234.9	246.7

**TABLE 9B ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE II**  
 Single Family, Single Story, Full Basement  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**

**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3
<b>200</b>	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.9	11.5	12.1	12.7
<b>400</b>	7.2	8.4	9.6	10.9	12.1	13.3	14.5	15.7	16.9	18.1	19.3	20.5	21.7	22.9	24.1	25.3
<b>600</b>	10.9	12.7	14.5	16.3	18.1	19.9	21.7	23.5	25.3	27.1	28.9	30.7	32.6	34.4	36.2	38.0
<b>800</b>	14.5	16.9	19.3	21.7	24.1	26.5	28.9	31.3	33.8	36.2	38.6	41.0	43.4	45.8	48.2	50.6
<b>1,000</b>	18.1	21.1	24.1	27.1	30.1	33.2	36.2	39.2	42.2	45.2	48.2	51.2	54.3	57.3	60.3	63.3
<b>1,200</b>	21.7	25.3	28.9	32.6	36.2	39.8	43.4	47.0	50.6	54.3	57.9	61.5	65.1	68.7	72.3	76.0
<b>1,400</b>	25.3	29.5	33.8	38.0	42.2	46.4	50.6	54.9	59.1	63.3	67.5	71.7	76.0	80.2	84.4	88.6
<b>1,600</b>	28.9	33.8	38.6	43.4	48.2	53.1	57.9	62.7	67.5	72.3	77.2	82.0	86.8	91.6	96.5	101.3
<b>1,800</b>	32.6	38.0	43.4	48.8	54.3	59.7	65.1	70.5	76.0	81.4	86.8	92.2	97.7	103.1	108.5	113.9
<b>2,000</b>	36.2	42.2	48.2	54.3	60.3	66.3	72.3	78.4	84.4	90.4	96.5	102.5	108.5	114.5	120.6	126.6
<b>2,200</b>	39.8	46.4	53.1	59.7	66.3	72.9	79.6	86.2	92.8	99.5	106.1	112.7	119.4	126.0	132.6	139.3
<b>2,400</b>	43.4	50.6	57.9	65.1	72.3	79.6	86.8	94.0	101.3	108.5	115.8	123.0	130.2	137.5	144.7	151.9
<b>2,600</b>	47.0	54.9	62.7	70.5	78.4	86.2	94.0	101.9	109.7	117.6	125.4	133.2	141.1	148.9	156.7	164.6
<b>2,800</b>	50.6	59.1	67.5	76.0	84.4	92.8	101.3	109.7	118.2	126.6	135.0	143.5	151.9	160.4	168.8	177.2
<b>3,000</b>	54.3	63.3	72.3	81.4	90.4	99.5	108.5	117.6	126.6	135.6	144.7	153.7	162.8	171.8	180.9	189.9

**TABLE 9C ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE III**  
 Single Family, Two Story, Partial (Less Than 50%) or No Basement  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**

**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	2.0	2.4	2.7	3.1	3.4	3.7	4.1	4.4	4.8	5.1	5.4	5.8	6.1	6.5	6.8	7.1
<b>200</b>	4.1	4.8	5.4	6.1	6.8	7.5	8.2	8.8	9.5	10.2	10.9	11.6	12.3	12.9	13.6	14.3
<b>400</b>	8.2	9.5	10.9	12.3	13.6	15.0	16.3	17.7	19.1	20.4	21.8	23.1	24.5	25.9	27.2	28.6
<b>600</b>	12.3	14.3	16.3	18.4	20.4	22.5	24.5	26.5	28.6	30.6	32.7	34.7	36.8	38.8	40.8	42.9
<b>800</b>	16.3	19.1	21.8	24.5	27.2	30.0	32.7	35.4	38.1	40.8	43.6	46.3	49.0	51.7	54.5	57.2
<b>1,000</b>	20.4	23.8	27.2	30.6	34.0	37.4	40.8	44.2	47.7	51.1	54.5	57.9	61.3	64.7	68.1	71.5
<b>1,200</b>	24.5	28.6	32.7	36.8	40.8	44.9	49.0	53.1	57.2	61.3	65.4	69.4	73.5	77.6	81.7	85.8
<b>1,400</b>	28.6	33.4	38.1	42.9	47.7	52.4	57.2	61.9	66.7	71.5	76.2	81.0	85.8	90.5	95.3	100.1
<b>1,600</b>	32.7	38.1	43.6	49.0	54.5	59.9	65.4	70.8	76.2	81.7	87.1	92.6	98.0	103.5	108.9	114.4
<b>1,800</b>	36.8	42.9	49.0	55.1	61.3	67.4	73.5	79.6	85.8	91.9	98.0	104.2	110.3	116.4	122.5	128.7
<b>2,000</b>	40.8	47.7	54.5	61.3	68.1	74.9	81.7	88.5	95.3	102.1	108.9	115.7	122.5	129.3	136.2	143.0
<b>2,200</b>	44.9	52.4	59.9	67.4	74.9	82.4	89.9	97.3	104.8	112.3	119.8	127.3	134.8	142.3	149.8	157.3
<b>2,400</b>	49.0	57.2	65.4	73.5	81.7	89.9	98.0	106.2	114.4	122.5	130.7	138.9	147.0	155.2	163.4	171.5
<b>2,600</b>	53.1	61.9	70.8	79.6	88.5	97.3	106.2	115.0	123.9	132.7	141.6	150.4	159.3	168.1	177.0	185.8
<b>2,800</b>	57.2	66.7	76.2	85.8	95.3	104.8	114.4	123.9	133.4	143.0	152.5	162.0	171.5	181.1	190.6	200.1
<b>3,000</b>	61.3	71.5	81.7	91.9	102.1	112.3	122.5	132.7	143.0	153.2	163.4	173.6	183.8	194.0	204.2	214.4

**TABLE 9D ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE IV**  
 Single Family, Two Story, Full Basement  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**

**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	2.2	2.6	3.0	3.4	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.4	6.7	7.1	7.5	7.9
<b>200</b>	4.5	5.2	6.0	6.7	7.5	8.2	9.0	9.7	10.5	11.2	12.0	12.7	13.5	14.2	15.0	15.7
<b>400</b>	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0	31.5
<b>600</b>	13.5	15.7	18.0	20.2	22.5	24.7	27.0	29.2	31.5	33.7	36.0	38.2	40.4	42.7	44.9	47.2
<b>800</b>	18.0	21.0	24.0	27.0	30.0	33.0	36.0	38.9	41.9	44.9	47.9	50.9	53.9	56.9	59.9	62.9
<b>1,000</b>	22.5	26.2	30.0	33.7	37.5	41.2	44.9	48.7	52.4	56.2	59.9	63.7	67.4	71.2	74.9	78.6
<b>1,200</b>	27.0	31.5	36.0	40.4	44.9	49.4	53.9	58.4	62.9	67.4	71.9	76.4	80.9	85.4	89.9	94.4
<b>1,400</b>	31.5	36.7	41.9	47.2	52.4	57.7	62.9	68.2	73.4	78.6	83.9	89.1	94.4	99.6	104.9	110.1
<b>1,600</b>	36.0	41.9	47.9	53.9	59.9	65.9	71.9	77.9	83.9	89.9	95.9	101.9	107.9	113.8	119.8	125.8
<b>1,800</b>	40.4	47.2	53.9	60.7	67.4	74.2	80.9	87.6	94.4	101.1	107.9	114.6	121.3	128.1	134.8	141.6
<b>2,000</b>	44.9	52.4	59.9	67.4	74.9	82.4	89.9	97.4	104.9	112.4	119.8	127.3	134.8	142.3	149.8	157.3
<b>2,200</b>	49.4	57.7	65.9	74.2	82.4	90.6	98.9	107.1	115.3	123.6	131.8	140.1	148.3	156.5	164.8	173.0
<b>2,400</b>	53.9	62.9	71.9	80.9	89.9	98.9	107.9	116.8	125.8	134.8	143.8	152.8	161.8	170.8	179.8	188.7
<b>2,600</b>	58.4	68.2	77.9	87.6	97.4	107.1	116.8	126.6	136.3	146.1	155.8	165.5	175.3	185.0	194.7	204.5
<b>2,800</b>	62.9	73.4	83.9	94.4	104.9	115.3	125.8	136.3	146.8	157.3	167.8	178.3	188.7	199.2	209.7	220.2
<b>3,000</b>	67.4	78.6	89.9	101.1	112.4	123.6	134.8	146.1	157.3	168.5	179.8	191.0	202.2	213.5	224.7	235.9

**TABLE 9E ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE V**  
 Apartments  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**  
**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	1.5	1.7	2.0	2.2	2.4	2.7	2.9	3.2	3.4	3.7	3.9	4.2	4.4	4.7	4.9	5.1
<b>200</b>	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.3	7.8	8.3	8.8	9.3	9.8	10.3
<b>400</b>	5.9	6.9	7.8	8.8	9.8	10.8	11.8	12.7	13.7	14.7	15.7	16.7	17.6	18.6	19.6	20.6
<b>600</b>	8.8	10.3	11.8	13.2	14.7	16.2	17.6	19.1	20.6	22.0	23.5	25.0	26.5	27.9	29.4	30.9
<b>800</b>	11.8	13.7	15.7	17.6	19.6	21.6	23.5	25.5	27.4	29.4	31.4	33.3	35.3	37.2	39.2	41.2
<b>1,000</b>	14.7	17.1	19.6	22.0	24.5	26.9	29.4	31.8	34.3	36.7	39.2	41.6	44.1	46.5	49.0	51.4
<b>1,200</b>	17.6	20.6	23.5	26.5	29.4	32.3	35.3	38.2	41.2	44.1	47.0	50.0	52.9	55.9	58.8	61.7
<b>1,400</b>	20.6	24.0	27.4	30.9	34.3	37.7	41.2	44.6	48.0	51.4	54.9	58.3	61.7	65.2	68.6	72.0
<b>1,600</b>	23.5	27.4	31.4	35.3	39.2	43.1	47.0	51.0	54.9	58.8	62.7	66.6	70.6	74.5	78.4	82.3
<b>1,800</b>	26.5	30.9	35.3	39.7	44.1	48.5	52.9	57.3	61.7	66.1	70.6	75.0	79.4	83.8	88.2	92.6
<b>2,000</b>	29.4	34.3	39.2	44.1	49.0	53.9	58.8	63.7	68.6	73.5	78.4	83.3	88.2	93.1	98.0	102.9
<b>2,200</b>	32.3	37.7	43.1	48.5	53.9	59.3	64.7	70.1	75.5	80.8	86.2	91.6	97.0	102.4	107.8	113.2
<b>2,400</b>	35.3	41.2	47.0	52.9	58.8	64.7	70.6	76.4	82.3	88.2	94.1	100.0	105.8	111.7	117.6	123.5
<b>2,600</b>	38.2	44.6	51.0	57.3	63.7	70.1	76.4	82.8	89.2	95.5	101.9	108.3	114.7	121.0	127.4	133.8
<b>2,800</b>	41.2	48.0	54.9	61.7	68.6	75.5	82.3	89.2	96.0	102.9	109.8	116.6	123.5	130.3	137.2	144.1
<b>3,000</b>	44.1	51.4	58.8	66.1	73.5	80.8	88.2	95.5	102.9	110.2	117.6	124.9	132.3	139.6	147.0	154.3

**TABLE 9F ANNUAL MBTU USAGE (MILLIONS BTUS) - PROTOTYPE VI**  
 Mobile Homes  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**

**Heating Degree Days**

<b>Gross Sq Ft</b>	<b>3,000</b>	<b>3,500</b>	<b>4,000</b>	<b>4,500</b>	<b>5,000</b>	<b>5,500</b>	<b>6,000</b>	<b>6,500</b>	<b>7,000</b>	<b>7,500</b>	<b>8,000</b>	<b>8,500</b>	<b>9,000</b>	<b>9,500</b>	<b>10,000</b>	<b>10,500</b>
<b>100</b>	3.8	4.5	5.1	5.7	6.4	7.0	7.6	8.3	8.9	9.6	10.2	10.8	11.5	12.1	12.7	13.4
<b>200</b>	7.6	8.9	10.2	11.5	12.7	14.0	15.3	16.6	17.8	19.1	20.4	21.7	22.9	24.2	25.5	26.8
<b>400</b>	15.3	17.8	20.4	22.9	25.5	28.0	30.6	33.1	35.7	38.2	40.8	43.3	45.9	48.4	51.0	53.5
<b>600</b>	22.9	26.8	30.6	34.4	38.2	42.1	45.9	49.7	53.5	57.4	61.2	65.0	68.8	72.7	76.5	80.3
<b>800</b>	30.6	35.7	40.8	45.9	51.0	56.1	61.2	66.3	71.4	76.5	81.6	86.7	91.8	96.9	102.0	107.1
<b>1,000</b>	38.2	44.6	51.0	57.4	63.7	70.1	76.5	82.9	89.2	95.6	102.0	108.4	114.7	121.1	127.5	133.9
<b>1,200</b>	45.9	53.5	61.2	68.8	76.5	84.1	91.8	99.4	107.1	114.7	122.4	130.0	137.7	145.3	153.0	160.6
<b>1,400</b>	53.5	62.5	71.4	80.3	89.2	98.2	107.1	116.0	124.9	133.9	142.8	151.7	160.6	169.6	178.5	187.4
<b>1,600</b>	61.2	71.4	81.6	91.8	102.0	112.2	122.4	132.6	142.8	153.0	163.2	173.4	183.6	193.8	204.0	214.2
<b>1,800</b>	68.8	80.3	91.8	103.3	114.7	126.2	137.7	149.2	160.6	172.1	183.6	195.1	206.5	218.0	229.5	241.0
<b>2,000</b>	76.5	89.2	102.0	114.7	127.5	140.2	153.0	165.7	178.5	191.2	204.0	216.7	229.5	242.2	255.0	267.7
<b>2,200</b>	84.1	98.2	112.2	126.2	140.2	154.3	168.3	182.3	196.3	210.4	224.4	238.4	252.4	266.4	280.5	294.5
<b>2,400</b>	91.8	107.1	122.4	137.7	153.0	168.3	183.6	198.9	214.2	229.5	244.8	260.1	275.4	290.7	306.0	321.3
<b>2,600</b>	99.4	116.0	132.6	149.2	165.7	182.3	198.9	215.5	232.0	248.6	265.2	281.7	298.3	314.9	331.5	348.0
<b>2,800</b>	107.1	124.9	142.8	160.6	178.5	196.3	214.2	232.0	249.9	267.7	285.6	303.4	321.3	339.1	357.0	374.8
<b>3,000</b>	114.7	133.9	153.0	172.1	191.2	210.4	229.5	248.6	267.7	286.8	306.0	325.1	344.2	363.3	382.5	401.6

**TABLE 10 HEATING/COOLING DEGREE DAYS AND MPS ZONES**

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
<b>ILLINOIS</b>			
Broadview, IL	6,083	1,001	4
Chicago, IL	6,083	1,001	4
Danville, IL	5,555	1,027	4
Harrisburg, IL	4,666	1,379	4
Havana, IL	5,980	1,059	6
Jonesboro, IL	4,383	1,330	4
Marion, IL	5,168	1,112	4
North Chicago, IL	6,630	702	4
Springfield, IL	5,596	1,165	6
Westchester, IL	6,630	702	4
<b>INDIANA</b>			
Chesterton, IN	6,456	694	7
Dale, IN	4,967	1,259	4
Fort Wayne, IN	6,205	830	7
Indianapolis, IN	5,521	1,042	5
Marion, IN	6,143	819	5
Seymour, IN	5,472	943	5
Terre Haute, IN	5,433	1,107	5
<b>IOWA</b>			
Des Moines, IA	6,436	1,052	7
Knoxville, IA	6,554	923	7
Missouri Valley, IA	6,695	937	7
West Branch, IA	6,052	1,134	7
<b>MICHIGAN</b>			
Battle Creek, MI	6,742	559	8
East Tawas, MI	7,438	362	8
Frankfort, MI	7,262	383	8
Fremont, MI	7,607	364	8
Gaylord, MI	8,200	308	8
Gladstone, MI	8,584	223	8
Grayling, MI	8,658	254	8
Houghton, MI	8,166	318	8
Iron Mountain, MI	8,784	325	8
Iron River, MI	10,028	148	8



TABLE 10 HEATING/COOLING DEGREE DAYS AND MPS ZONES (Continued)

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
MICHIGAN (Continued)			
Manistee, MI	6,970	478	8
Manistique, MI	8,945	158	8
Milan, MI	6,683	529	8
Mount Clemens, MI	6,620	597	8
Munising, MI	9,025	163	8
Newberry, MI	8,582	243	8
Ontonagon, MI	8,469	271	8
Reed City, MI	8,123	301	8
Saginaw, MI	7,099	548	8
St. Ignace, MI	8,156	274	8
MINNESOTA			
Aitkin, MN	9,461	259	8
Aurora, MN	10,025	243	8
Bemidji, MN	9,540	349	8
Chaska, MN	7,549	803	8
Detroit Lakes, MN	9,212	489	8
Duluth, MN	9,724	189	8
Ely, MN	10,572	178	8
Grand Rapids, MN	9,533	295	8
International Falls, MN	10,269	233	8
Little Falls, MN	8,447	602	8
Minneapolis, MN	7,876	699	8
Morris, MN	8,758	568	8
Pipestone, MN	8,422	611	8
Roseau, MN	10,628	305	8
Sandstone, MN	9,102	346	8
Silver Bay, MN	10,674	97	8
Thief River Falls, MN	9,822	448	8
Virginia, MN	10,039	214	8
MISSOURI			
Bloomfield, MO	4,118	1,641	4
Brookfield, MO	5,928	1,032	6
Doniphan, MO	4,616	1,303	4
Independence, MO	5,373	1,176	4
Joplin, MO	4,253	1,555	4

TABLE 10 HEATING/COOLING DEGREE DAYS AND MPS ZONES (Continued)

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
MISSOURI (Continued)			
Mountain View, MO	4,845	1,133	4
Potosi, MO	4,886	1,268	4
Salem, MO	4,381	1,324	4
Springfield, MO	4,602	1,366	4
Waynesville, MO	4,682	1,255	4
NEBRASKA			
Falls City, NE	5,795	1,282	6
OHIO			
Akron, OH	5,752	856	6
Brecksville, OH	6,121	702	6
Chillicothe, OH	5,570	863	6
Cincinnati, OH	4,883	1,131	6
Coshocton, OH	5,680	734	6
McArthur, OH	5,989	615	6
Oak Harbor, OH	5,894	845	6
Port Clinton, OH	6,209	814	6
WISCONSIN			
Crandon, WI	9,474	166	8
Medford, WI	8,971	332	8
Milwaukee, WI	7,087	616	8
Osceola, WI	8,036	639	8
Park Falls, WI	9,078	297	8
Rhineland, WI	9,080	288	8
Somerset, WI	7,606	715	8
Spooner, WI	8,452	429	8
Tomah, WI	7,931	541	8
Viroqua, WI	8,259	383	8
Washburn, WI	8,452	429	8

**TABLE 11 FUEL REQUIRED TO PRODUCE 1 MBTU**

<b>Type of Fuel</b>	<b>Amount Needed to Produce 1 MBTU</b>
Natural Gas	1 MCF (1,000 cu. ft.)
Propane	10.2 Gallons
Fuel Oil #2	7.04 Gallons

**TABLE 12 HEATING FUEL COST**

NORTH CENTRAL REGION

<b>Type of Fuel</b>	<b>Charge per unit</b>
Natural Gas	\$12.72
Propane	\$1.68
Fuel Oil #2	\$2.62

**TABLE 13 MPS HEATING ZONE CONVERSION FACTORS**

NORTH CENTRAL REGION						
Dwelling Prototypes						
	I	II	III	IV	V	VI
HUD MPS Heating Zone	Single Story No Basement	Single Story Full Basement	Double Story No Basement	Double Story Full Basement	Apartments	Mobile Homes
1						
2						
3						
4	.92	.89	.90	.91	.87	.91
5	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00
7	1.05	1.07	1.06	1.06	1.09	1.06
8	.95	.93	.94	.94	.91	.94

D. SPACE HEATING (ELECTRICITY) CONSUMPTION/COST CALCULATIONS

The procedure for calculating electrical consumption and costs for space heating (where electricity is unmetered or otherwise unmeasured) is similar to the procedure used for fossil fuels. Tables 14a through 14f are used.

1. Select from these tables the dwelling prototype most similar to the unit at issue.
2. Determine the annual kilowatt hour (KwH) consumption by finding the appropriate columns for square feet and HDD (heating degree days). Note: HDDs for the nearest established communities may be found in Table 10.
3. Divide the annual KwH by 12 to determine the monthly average electrical consumption.
4. Adjust for HUD MPS Heating Zone, using the conversion factors in Table 13.
5. Adjust for heat pump (if applicable).
6. Determine the appropriate charge per KwH from the table below. **Do not calculate the total cost of electricity in steps – such as the first 500 KwH costs so much, then the second 500 KwH costs so much, etc.**

<u>KwH Consumed</u> <u>Per Month</u>	North Central Region <u>Charge per KwH</u>
1 – 500	\$.113
501 – 1,000	\$.105
1,001 – 1,500	\$.101
Over 1,500	\$.099

7. Compute the monthly charge for space heating by multiplying the appropriate charge per KwH times the number of KwH consumed per month.
8. Example: The average monthly electric heating charge for a single family, 2,100 square foot, two story, no basement home located near Frankfort, Michigan is computed as follows:
  - a. Step 1. Select the table (table 14a through f) that most closely describes the housing unit at issue. In this case, table 14c (single family, two story, no basement - prototype III) should be selected.
  - b. Step 2. Determine from table 14c the annual KwH consumption appropriate for the heating degree days (HDD) and the gross square footage of the house in this example. Use the table as follows:
    - 1) Find the number of heating degree days for the established community in which the unit is located. Table 10 (which contains the HDD for established communities in the North Central survey region) shows that Frankfort, MI has 7,262 HDD. In table 14c, the number

of HDDs in Frankfort, MI (7,262) lies between the column headed 6,500 and the column headed 7,500. Round down to 6,500 HDD.

- 2) In table 14c, 2,100 square feet (the size of the house used in this example) lies between 2,000 and 2,200 square feet. Round 2,100 down to 2,000 square feet.
  - 3) From table 14c (2,000 square feet and 6,500 HDD) the annual Kwh consumption rate is 20,744 Kwh.
- c. Step 3. Calculate the monthly Kwh consumption by dividing the annual Kwh by 12 (months). In this instance, the monthly consumption is 1,728.67 Kwh ( $20,744 / 12 = 1,728.67$  Kwh per month).
- d. Step 4, HUD MPS Zone adjustment. The HUD MPS Zone adjustment is made as follows:
- 1) Use Table 10 to find the HUD MPS zone for the community at issue. In this manner, Frankfort, MI is found to be in HUD MPS Zone 8.
  - 2) In Table 13, determine the adjustment factor for the appropriate dwelling type and MPS zone. The factor for housing prototype III in HUD MPS Zone 8 is 0.94.
  - 3) Multiply the monthly electric consumption (as computed in paragraph 8c, above) times the HUD MPS adjustment factor ( $1,728.67 \times 0.94 = 1,624.95$  Kwh per month).
- e. Step 5, **Adjustment for heat pump.** The process described above is used for computing the electrical consumption for heating with a straight resistance heating system. However, where a dwelling is heated with an electric heat pump, the resistance heating consumption (1,624.95 Kwh in this example) should be multiplied by a factor of 0.75, which represents the greater efficiency of the heat pump. In this example, the monthly electric consumption for a heat pump as the heating source would be 1,218.71 Kwh ( $1,624.95 \times 0.75 = 1,218.71$ ).
- f. Step 6. The final step is to compute the monthly charge for the electricity consumed. This is done by multiplying the charge per Kwh times the Kwh consumed per month. The appropriate charge per Kwh may be found in the table below.

<u>Kwh Consumed</u> <u>Per Month</u>	<u>North Central Region</u> <u>Charge per Kwh</u>
1 – 500	\$.113
501 – 1,000	\$.105
1,001 – 1,500	\$.101
Over 1,500	\$.099

In this example, the average monthly consumption (1,624.95 Kwh) for resistance heat falls in the “Over 1,500” Kwh per month consumption category; the appropriate charge is \$0.099 per Kwh. The average monthly consumption (1,218.71 Kwh) for a heat pump falls in the “1,001 – 1,500” Kwh per month consumption category; and the appropriate unit charge is \$0.101 per Kwh.

Therefore, the monthly electric heating charge for the house used in this example is computed as follows:

Resistance heat: 1,624.95 Kwh x \$.099 = \$160.87 monthly

Heat pump: 1,218.71 Kwh x \$.101 = \$123.09 monthly

#### E. SPACE COOLING CONSUMPTION/COST CALCULATIONS

Space cooling costs are calculated in the same manner as for electric space heating except that Cooling Degree Days (CDD) are used in lieu of HDD values. CDD values for the Nearest Established Communities are found in Table 10. Additionally, only Tables 14a through 14f are used in calculating cooling energy consumption. Briefly, the steps are as follows.

1. Select from Tables 14a through 14f the table that most closely describes the housing unit at issue.
2. Based on the size of the dwelling (square feet) and the number of CDD (from Table 10), use the appropriate Table (14a-f) to determine the annual Kwh consumption.
3. Divide the annual Kwh consumption by 12 (months) to determine the average number of Kwh consumed per month.
4. Apply the HUD MPS Zone adjustment factor.
5. Apply the Coefficient of Performance (COP) adjustment.
6. Determine the appropriate charge per Kwh from the table below.

<u>Kwh Consumed Per Month</u>	<u>North Central Region Charge per Kwh</u>
1 – 500	\$.113
501 – 1,000	\$.105
1,001 – 1,500	\$.101
Over 1,500	\$.099

7. Compute the monthly charge for space cooling by multiplying the appropriate charge per Kwh times the number of Kwh consumed per month.
8. Example: Compute the average monthly electric cooling charge for a 1,275 square foot mobile home near Harrisburg, Illinois.
  - a. Step 1: Table Selection. Select the table (table 14a through 14f), which most closely describes the housing unit at issue. Table 14f (Mobile Homes - Prototype VI) should be selected.

- b. Step 2: Annual Kwh Consumption. Determine from table 14f the annual Kwh consumption appropriate for the cooling degree days (CDD) and the gross square footage of the mobile home in this example. Use the table as follows:
- 1) Find the number of cooling degree days for the established community closest to the housing. Table 10 (which contains the CDD for established communities in the North Central survey region) shows that Harrisburg, IL has 1,379 CDD. In table 14f, 1,379 CDD lies between the columns headed 1,350 and 1,600. Round down to 1,350 CDD.
  - 2) In table 14f, 1,275 square feet (the size of the mobile home used in this example) lies between 1,200 and 1,400 square feet. Round down to 1,200 square feet.
  - 3) From table 14f (1,200 square feet and 1,350 CDD) the annual Kwh consumption rate is 4,841 Kwh.
- c. Step 3: Monthly Consumption. Calculate the monthly Kwh consumption by dividing the annual Kwh consumption by 12 (months). In this instance, the monthly consumption is 403.42 Kwh rounded ( $4,841 / 12 = 403.42$ ).
- d. Step 4: HUD MPS Zone Adjustment. The HUD MPS Zone adjustment is made as follows:
- 1) Use Table 10 to find the HUD MPS Zone for the community at issue. In this manner, Harrisburg, IL is found to be in HUD MPS Zone 4.
  - 2) In Table 15, determine the adjustment factor for the appropriate dwelling unit type and MPS Zone. The factor for housing prototype VI in HUD MPS Zone 4 is 2.15.
  - 3) Multiply the monthly electric consumption (as computed in paragraph 8c, above) times the HUD MPS Zone adjustment factor:  $403.42 \text{ Kwh} \times 2.15 = 867.35 \text{ Kwh per month}$ .
- e. Step 5: Adjustment for Coefficient of Performance (COP). This adjustment accounts for the differences in the efficiencies of evaporative (swamp) and refrigerated air central cooling systems.
- 1) Evaporative (swamp) cooling. For a central evaporative cooling system, the adjusted Kwh (computed in Step 4, above) is divided by a factor of 6.66. In this example, the monthly Kwh requirement for central evaporative cooling is computed as  $867.35 / 6.66 = 130.23 \text{ Kwh per month}$ .
  - 2) Refrigerated air cooling. For a central refrigerated air cooling system, the adjusted Kwh (computed in step 4, above) is divided by a factor of 2. In this example, the monthly Kwh requirement for central refrigerated air cooling is computed as  $867.35 / 2 = 433.68 \text{ Kwh per month}$ .
- f. Step 6: Monthly Charge. The final step is to compute the monthly charge for the electricity consumed. This is done by multiplying the electricity rate times the Kwh consumed per month. The appropriate charge per Kwh may be found in the table below.



<u>KwH Consumed</u> <u>Per Month</u>	<u>North Central Region</u> <u>Charge per KwH</u>
1 – 500	\$.113
501 – 1,000	\$.105
1,001 – 1,500	\$.101
Over 1,500	\$.099

In this example, the average monthly consumption (130.23 KwH) for evaporative cooling falls in the “1 – 500” KwH consumption range. And 433.68 KwH for refrigerated cooling also falls in the “1 – 500” KwH consumption range. The appropriate charge will be \$0.113 per KwH for evaporative cooling and \$.113 for refrigerated cooling.

Therefore, the monthly charges for cooling the mobile home used in this example would be computed as follows.

Evaporative cooling:  $130.23 \text{ KwH} \times \$0.113 = \$14.72$  monthly

Refrigerated cooling:  $433.68 \text{ KwH} \times \$0.113 = \$49.01$  monthly

9. Gas-powered Central Air Conditioning Units. If the central air conditioning unit is gas operated (natural gas or propane), the charge is computed as follows:
  - a. Compute the KwH consumption in same manner as shown in steps 1 through 4 above (Note: the calculations through step 4 produce 867.35 KwH per month).
  - b. Calculate the Coefficient of Performance (COP) adjustment in step 5 above for refrigerated air conditioning; that is, divide the number of KwH in paragraph 9a, above (867.35 KwH) by the COP (2); for example  $867.35 / 2 = 433.68 \text{ KwH}$ .
  - c. Convert the monthly KwH to MBTUs by dividing the KwH calculated in paragraph 9b above by 234.4. Thus,  $433.68 \text{ KwH} / 234.4 \text{ (KwH per MBTU)} = 1.85 \text{ MBTUs}$ . [It takes 234.4 Kilowatts to generate 1 MBTU.]
  - d. Calculate the volumes of natural gas and propane needed to produce 1.85 MBTUs. This is done as follows.
    - 1) Natural Gas. For central air conditioning units that operate on natural gas, multiply the MBTUs calculated in paragraph 9c above by 1 MCF ( $1.85 \text{ MBTUs} \times 1 \text{ MCF} = 1.85 \text{ MCF}$ ). Thus, 1.85 MCF of natural gas would be required per month (annual average) to cool the unit in this example.
    - 2) Propane. For central air conditioning units that operate on propane gas, multiply the MBTUs calculated in paragraph 9c above by 10.2 gallons ( $1.85 \text{ MBTUs} \times 10.2 \text{ gallons} = 18.87 \text{ gallons}$ ).

Thus, 18.87 gallons of propane would be required per month (annual average) to cool the unit in this example.

- e. Calculate the monthly charge for natural gas or propane consumed. This is done by multiplying the volume of fuel consumed by the unit cost of the fuel. These calculations are shown below.

Natural gas:  $1.85 \text{ MCF} \times \$12.72 \text{ per MCF} = \$23.53 \text{ per month}$

Propane gas:  $18.87 \text{ gallons} \times \$1.68 \text{ per gallon} = \$31.70 \text{ per month}$

**TABLE 14A ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE I**  
 Single Family, One Story, Partial (Less Than 50%) or No Basement  
 NORTH CENTRAL REGION

<b>Baseline City: Springfield, Illinois</b>																
<b>Heating or Cooling Degree Days</b>																
<b>Gross Sq Ft</b>	<b>100</b>	<b>350</b>	<b>600</b>	<b>850</b>	<b>1,100</b>	<b>1,350</b>	<b>1,600</b>	<b>1,850</b>	<b>3,500</b>	<b>4,500</b>	<b>5,500</b>	<b>6,500</b>	<b>7,500</b>	<b>8,500</b>	<b>9,500</b>	<b>10,500</b>
<b>100</b>	18	64	110	156	202	248	294	340	642	826	1,010	1,193	1,377	1,560	1,744	1,927
<b>200</b>	37	128	220	312	404	496	587	679	1,285	1,652	2,019	2,386	2,753	3,121	3,488	3,855
<b>400</b>	73	257	441	624	808	991	1,175	1,358	2,570	3,304	4,038	4,773	5,507	6,241	6,975	7,710
<b>600</b>	110	385	661	936	1,212	1,487	1,762	2,038	3,855	4,956	6,058	7,159	8,260	9,362	10,463	11,564
<b>800</b>	147	514	881	1,248	1,615	1,982	2,350	2,717	5,140	6,608	8,077	9,545	11,014	12,482	13,951	15,419
<b>1,000</b>	184	642	1,101	1,560	2,019	2,478	2,937	3,396	6,425	8,260	10,096	11,932	13,767	15,603	17,438	19,274
<b>1,200</b>	220	771	1,322	1,872	2,423	2,974	3,524	4,075	7,710	9,912	12,115	14,318	16,521	18,723	20,926	23,129
<b>1,400</b>	257	899	1,542	2,184	2,827	3,469	4,112	4,754	8,995	11,564	14,134	16,704	19,274	21,844	24,414	26,984
<b>1,600</b>	294	1,028	1,762	2,496	3,231	3,965	4,699	5,433	10,280	13,217	16,154	19,091	22,028	24,965	27,902	30,839
<b>1,800</b>	330	1,156	1,982	2,809	3,635	4,461	5,287	6,113	11,564	14,869	18,173	21,477	24,781	28,085	31,389	34,693
<b>2,000</b>	367	1,285	2,203	3,121	4,038	4,956	5,874	6,792	12,849	16,521	20,192	23,863	27,534	31,206	34,877	38,548
<b>2,200</b>	404	1,413	2,423	3,433	4,442	5,452	6,461	7,471	14,134	18,173	22,211	26,249	30,288	34,326	38,365	42,403
<b>2,400</b>	441	1,542	2,643	3,745	4,846	5,947	7,049	8,150	15,419	19,825	24,230	28,636	33,041	37,447	41,852	46,258
<b>2,600</b>	477	1,670	2,864	4,057	5,250	6,443	7,636	8,829	16,704	21,477	26,249	31,022	35,795	40,567	45,340	50,113
<b>2,800</b>	514	1,799	3,084	4,369	5,654	6,939	8,224	9,509	17,989	23,129	28,269	33,408	38,548	43,688	48,828	53,967
<b>3,000</b>	551	1,927	3,304	4,681	6,058	7,434	8,811	10,188	19,274	24,781	30,288	35,795	41,302	46,809	52,315	57,822

**TABLE 14B ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE II**  
 Single Family, Single Story, Full Basement  
 NORTH CENTRAL REGION

Baseline City: Springfield, Illinois																
Heating or Cooling Degree Days																
Gross Sq Ft	100	350	600	850	1,100	1,350	1,600	1,850	3,500	4,500	5,500	6,500	7,500	8,500	9,500	10,500
100	14	49	85	120	155	191	226	261	495	636	777	919	1,060	1,201	1,342	1,484
200	28	99	170	240	311	382	452	523	989	1,272	1,554	1,837	2,120	2,402	2,685	2,968
400	57	198	339	480	622	763	904	1,046	1,978	2,544	3,109	3,674	4,239	4,805	5,370	5,935
600	85	297	509	721	933	1,145	1,357	1,569	2,968	3,815	4,663	5,511	6,359	7,207	8,055	8,903
800	113	396	678	961	1,244	1,526	1,809	2,091	3,957	5,087	6,218	7,348	8,479	9,609	10,740	11,870
1,000	141	495	848	1,201	1,554	1,908	2,261	2,614	4,946	6,359	7,772	9,185	10,598	12,012	13,425	14,838
1,200	170	594	1,017	1,441	1,865	2,289	2,713	3,137	5,935	7,631	9,327	11,022	12,718	14,414	16,110	17,805
1,400	198	692	1,187	1,682	2,176	2,671	3,165	3,660	6,924	8,903	10,881	12,859	14,838	16,816	18,795	20,773
1,600	226	791	1,357	1,922	2,487	3,052	3,618	4,183	7,914	10,175	12,436	14,697	16,958	19,219	21,480	23,741
1,800	254	890	1,526	2,162	2,798	3,434	4,070	4,706	8,903	11,446	13,990	16,534	19,077	21,621	24,164	26,708
2,000	283	989	1,696	2,402	3,109	3,815	4,522	5,229	9,892	12,718	15,544	18,371	21,197	24,023	26,849	29,676
2,200	311	1,088	1,865	2,643	3,420	4,197	4,974	5,751	10,881	13,990	17,099	20,208	23,317	26,425	29,534	32,643
2,400	339	1,187	2,035	2,883	3,731	4,579	5,426	6,274	11,870	15,262	18,653	22,045	25,436	28,828	32,219	35,611
2,600	367	1,286	2,204	3,123	4,042	4,960	5,879	6,797	12,859	16,534	20,208	23,882	27,556	31,230	34,904	38,578
2,800	396	1,385	2,374	3,363	4,352	5,342	6,331	7,320	13,849	17,805	21,762	25,719	29,676	33,632	37,589	41,546
3,000	424	1,484	2,544	3,603	4,663	5,723	6,783	7,843	14,838	19,077	23,317	27,556	31,795	36,035	40,274	44,513

**TABLE 14C ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE III**  
 Single Family, Two Story, Partial (Less Than 50%) or No Basement  
 NORTH CENTRAL REGION

<b>Baseline City: Springfield, Illinois</b>																
<b>Heating or Cooling Degree Days</b>																
<b>Gross Sq Ft</b>	<b>100</b>	<b>350</b>	<b>600</b>	<b>850</b>	<b>1,100</b>	<b>1,350</b>	<b>1,600</b>	<b>1,850</b>	<b>3,500</b>	<b>4,500</b>	<b>5,500</b>	<b>6,500</b>	<b>7,500</b>	<b>8,500</b>	<b>9,500</b>	<b>10,500</b>
<b>100</b>	16	56	96	136	176	215	255	295	558	718	878	1,037	1,197	1,356	1,516	1,675
<b>200</b>	32	112	191	271	351	431	511	590	1,117	1,436	1,755	2,074	2,393	2,713	3,032	3,351
<b>400</b>	64	223	383	543	702	862	1,021	1,181	2,234	2,872	3,510	4,149	4,787	5,425	6,064	6,702
<b>600</b>	96	335	574	814	1,053	1,292	1,532	1,771	3,351	4,308	5,266	6,223	7,180	8,138	9,095	10,053
<b>800</b>	128	447	766	1,085	1,404	1,723	2,042	2,362	4,468	5,744	7,021	8,297	9,574	10,851	12,127	13,404
<b>1,000</b>	160	558	957	1,356	1,755	2,154	2,553	2,952	5,585	7,180	8,776	10,372	11,967	13,563	15,159	16,754
<b>1,200</b>	191	670	1,149	1,628	2,106	2,585	3,064	3,542	6,702	8,617	10,531	12,446	14,361	16,276	18,191	20,105
<b>1,400</b>	223	782	1,340	1,899	2,457	3,016	3,574	4,133	7,819	10,053	12,287	14,521	16,754	18,988	21,222	23,456
<b>1,600</b>	255	894	1,532	2,170	2,808	3,447	4,085	4,723	8,936	11,489	14,042	16,595	19,148	21,701	24,254	26,807
<b>1,800</b>	287	1,005	1,723	2,441	3,159	3,877	4,596	5,314	10,053	12,925	15,797	18,669	21,541	24,414	27,286	30,158
<b>2,000</b>	319	1,117	1,915	2,713	3,510	4,308	5,106	5,904	11,170	14,361	17,552	20,744	23,935	27,126	30,318	33,509
<b>2,200</b>	351	1,229	2,106	2,984	3,862	4,739	5,617	6,494	12,287	15,797	19,308	22,818	26,328	29,839	33,349	36,860
<b>2,400</b>	383	1,340	2,298	3,255	4,213	5,170	6,127	7,085	13,404	17,233	21,063	24,892	28,722	32,552	36,381	40,211
<b>2,600</b>	415	1,452	2,489	3,526	4,564	5,601	6,638	7,675	14,521	18,669	22,818	26,967	31,115	35,264	39,413	43,562
<b>2,800</b>	447	1,564	2,681	3,798	4,915	6,032	7,149	8,266	15,638	20,105	24,573	29,041	33,509	37,977	42,445	46,913
<b>3,000</b>	479	1,675	2,872	4,069	5,266	6,462	7,659	8,856	16,754	21,541	26,328	31,115	35,902	40,689	45,476	50,263

**TABLE 14D ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE IV**  
 Single Family, Two Story, Full Basement  
 NORTH CENTRAL REGION

<b>Baseline City: Springfield, Illinois</b>																
<b>Heating or Cooling Degree Days</b>																
<b>Gross Sq Ft</b>	<b>100</b>	<b>350</b>	<b>600</b>	<b>850</b>	<b>1,100</b>	<b>1,350</b>	<b>1,600</b>	<b>1,850</b>	<b>3,500</b>	<b>4,500</b>	<b>5,500</b>	<b>6,500</b>	<b>7,500</b>	<b>8,500</b>	<b>9,500</b>	<b>10,500</b>
<b>100</b>	18	61	105	149	193	237	281	325	614	790	966	1,141	1,317	1,492	1,668	1,843
<b>200</b>	35	123	211	298	386	474	562	650	1,229	1,580	1,931	2,282	2,633	2,985	3,336	3,687
<b>400</b>	70	246	421	597	772	948	1,124	1,299	2,458	3,160	3,862	4,565	5,267	5,969	6,671	7,374
<b>600</b>	105	369	632	895	1,159	1,422	1,685	1,949	3,687	4,740	5,794	6,847	7,900	8,954	10,007	11,061
<b>800</b>	140	492	843	1,194	1,545	1,896	2,247	2,598	4,916	6,320	7,725	9,129	10,534	11,938	13,343	14,747
<b>1,000</b>	176	614	1,053	1,492	1,931	2,370	2,809	3,248	6,145	7,900	9,656	11,412	13,167	14,923	16,679	18,434
<b>1,200</b>	211	737	1,264	1,791	2,317	2,844	3,371	3,898	7,374	9,480	11,587	13,694	15,801	17,908	20,014	22,121
<b>1,400</b>	246	860	1,475	2,089	2,704	3,318	3,933	4,547	8,603	11,061	13,518	15,976	18,434	20,892	23,350	25,808
<b>1,600</b>	281	983	1,685	2,388	3,090	3,792	4,494	5,197	9,832	12,641	15,450	18,259	21,068	23,877	26,686	29,495
<b>1,800</b>	316	1,106	1,896	2,686	3,476	4,266	5,056	5,846	11,061	14,221	17,381	20,541	23,701	26,861	30,021	33,182
<b>2,000</b>	351	1,229	2,107	2,985	3,862	4,740	5,618	6,496	12,289	15,801	19,312	22,823	26,335	29,846	33,357	36,868
<b>2,200</b>	386	1,352	2,317	3,283	4,249	5,214	6,180	7,145	13,518	17,381	21,243	25,106	28,968	32,830	36,693	40,555
<b>2,400</b>	421	1,475	2,528	3,582	4,635	5,688	6,742	7,795	14,747	18,961	23,174	27,388	31,602	35,815	40,029	44,242
<b>2,600</b>	456	1,598	2,739	3,880	5,021	6,162	7,303	8,445	15,976	20,541	25,106	29,670	34,235	38,800	43,364	47,929
<b>2,800</b>	492	1,721	2,949	4,178	5,407	6,636	7,865	9,094	17,205	22,121	27,037	31,953	36,868	41,784	46,700	51,616
<b>3,000</b>	527	1,843	3,160	4,477	5,794	7,110	8,427	9,744	18,434	23,701	28,968	34,235	39,502	44,769	50,036	55,303

**TABLE 14E ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE V**  
 Apartments  
 NORTH CENTRAL REGION

Baseline City: Springfield, Illinois																
Heating or Cooling Degree Days																
Feet	100	350	600	850	1,100	1,350	1,600	1,850	3,500	4,500	5,500	6,500	7,500	8,500	9,500	10,500
100	11	40	69	98	126	155	184	212	402	517	632	747	861	976	1,091	1,206
200	23	80	138	195	253	310	368	425	804	1,034	1,263	1,493	1,723	1,953	2,182	2,412
400	46	161	276	391	505	620	735	850	1,608	2,067	2,527	2,986	3,446	3,905	4,364	4,824
600	69	241	413	586	758	930	1,103	1,275	2,412	3,101	3,790	4,479	5,168	5,858	6,547	7,236
800	92	322	551	781	1,011	1,240	1,470	1,700	3,216	4,135	5,054	5,972	6,891	7,810	8,729	9,648
1,000	115	402	689	976	1,263	1,551	1,838	2,125	4,020	5,168	6,317	7,466	8,614	9,763	10,911	12,060
1,200	138	482	827	1,172	1,516	1,861	2,205	2,550	4,824	6,202	7,580	8,959	10,337	11,715	13,093	14,472
1,400	161	563	965	1,367	1,769	2,171	2,573	2,975	5,628	7,236	8,844	10,452	12,060	13,668	15,276	16,884
1,600	184	643	1,103	1,562	2,021	2,481	2,940	3,400	6,432	8,270	10,107	11,945	13,783	15,620	17,458	19,296
1,800	207	724	1,240	1,757	2,274	2,791	3,308	3,825	7,236	9,303	11,371	13,438	15,505	17,573	19,640	21,708
2,000	230	804	1,378	1,953	2,527	3,101	3,675	4,250	8,040	10,337	12,634	14,931	17,228	19,525	21,822	24,120
2,200	253	884	1,516	2,148	2,779	3,411	4,043	4,675	8,844	11,371	13,897	16,424	18,951	21,478	24,005	26,531
2,400	276	965	1,654	2,343	3,032	3,721	4,410	5,100	9,648	12,404	15,161	17,917	20,674	23,430	26,187	28,943
2,600	299	1,045	1,792	2,538	3,285	4,031	4,778	5,525	10,452	13,438	16,424	19,410	22,397	25,383	28,369	31,355
2,800	322	1,126	1,930	2,734	3,538	4,342	5,146	5,949	11,256	14,472	17,688	20,904	24,120	27,335	30,551	33,767
3,000	345	1,206	2,067	2,929	3,790	4,652	5,513	6,374	12,060	15,505	18,951	22,397	25,842	29,288	32,734	36,179

**TABLE 14F ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - PROTOTYPE VI**  
 Mobile Homes  
 NORTH CENTRAL REGION

**Baseline City: Springfield, Illinois**

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**Heating or Cooling Degree Days**

<b>Gross Sq Ft</b>	<b>100</b>	<b>350</b>	<b>600</b>	<b>850</b>	<b>1,100</b>	<b>1,350</b>	<b>1,600</b>	<b>1,850</b>	<b>3,500</b>	<b>4,500</b>	<b>5,500</b>	<b>6,500</b>	<b>7,500</b>	<b>8,500</b>	<b>9,500</b>	<b>10,500</b>
<b>100</b>	30	105	179	254	329	403	478	553	1,046	1,345	1,644	1,942	2,241	2,540	2,839	3,138
<b>200</b>	60	209	359	508	657	807	956	1,106	2,092	2,689	3,287	3,885	4,482	5,080	5,678	6,275
<b>400</b>	120	418	717	1,016	1,315	1,614	1,912	2,211	4,184	5,379	6,574	7,770	8,965	10,160	11,355	12,551
<b>600</b>	179	628	1,076	1,524	1,972	2,421	2,869	3,317	6,275	8,068	9,861	11,654	13,447	15,240	17,033	18,826
<b>800</b>	239	837	1,434	2,032	2,630	3,227	3,825	4,423	8,367	10,758	13,148	15,539	17,930	20,320	22,711	25,102
<b>1,000</b>	299	1,046	1,793	2,540	3,287	4,034	4,781	5,528	10,459	13,447	16,436	19,424	22,412	25,400	28,389	31,377
<b>1,200</b>	359	1,255	2,152	3,048	3,945	4,841	5,737	6,634	12,551	16,137	19,723	23,309	26,895	30,480	34,066	37,652
<b>1,400</b>	418	1,464	2,510	3,556	4,602	5,648	6,694	7,740	14,643	18,826	23,010	27,193	31,377	35,561	39,744	43,928
<b>1,600</b>	478	1,673	2,869	4,064	5,259	6,455	7,650	8,845	16,734	21,516	26,297	31,078	35,859	40,641	45,422	50,203
<b>1,800</b>	538	1,883	3,227	4,572	5,917	7,262	8,606	9,951	18,826	24,205	29,584	34,963	40,342	45,721	51,100	56,478
<b>2,000</b>	598	2,092	3,586	5,080	6,574	8,068	9,562	11,057	20,918	26,895	32,871	38,848	44,824	50,801	56,777	62,754
<b>2,200</b>	657	2,301	3,945	5,588	7,232	8,875	10,519	12,162	23,010	29,584	36,158	42,732	49,307	55,881	62,455	69,029
<b>2,400</b>	717	2,510	4,303	6,096	7,889	9,682	11,475	13,268	25,102	32,273	39,445	46,617	53,789	60,961	68,133	75,305
<b>2,600</b>	777	2,719	4,662	6,604	8,546	10,489	12,431	14,374	27,193	34,963	42,732	50,502	58,271	66,041	73,811	81,580
<b>2,800</b>	837	2,929	5,020	7,112	9,204	11,296	13,387	15,479	29,285	37,652	46,020	54,387	62,754	71,121	79,488	87,855
<b>3,000</b>	896	3,138	5,379	7,620	9,861	12,103	14,344	16,585	31,377	40,342	49,307	58,271	67,236	76,201	85,166	94,131

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**TABLE 15 MPS COOLING ZONE CONVERSION FACTORS**

NORTH CENTRAL REGION

HUD MPS Heating Zone	Dwelling Prototypes					
	I	II	III	IV	V	VI
	Single Story No Basement	Single Story Full Basement	Double Story No Basement	Double Story Full Basement	Apartments	Mobile Homes
1						
2						
3						
4	1.94	2.21	2.12	1.96	2.52	2.15
5	2.24	2.60	2.47	2.28	3.01	2.49
6	2.24	2.60	2.47	2.28	3.01	2.49
7	2.61	3.08	2.89	2.67	3.60	2.89
8	1.29	1.37	1.38	1.29	1.49	1.45

## F. NON-SPACE HEATING/COOLING ENERGY CONSUMPTION/COST CALCULATIONS

The examples in the preceding sections (VI.C, VI.D and VI.E) dealt with the charges for space heating and cooling. However, to compute **total energy consumption** charges, the costs for energy consumed by lights, equipment, and appliances (government **and** tenant-owned) must be determined and added to the heating and cooling charges.

1. **Consumption.** Electric non-space heating/cooling consumption and cost estimates include electricity used by small appliances, lights, radios, television, refrigerators, ranges, washers, dryers, etc. These items, and their associated consumption levels, are shown in Table 16. It is assumed that every government quarter uses a furnace fan, television/radio, lights, and miscellaneous small appliances. Be sure to add these items from Table 16 in addition to any other applicable items in determining the total consumption.

To use Table 16, first determine the finished floor space square footage range within which a specific housing unit falls. Then, using the values in Table 16, add the Kwh consumed by each appliance or equipment item which is present in the housing unit. If a housing unit has more than one (1) refrigerator, freezer, room (window) air conditioner or space heater, multiply the Kwh shown in the table times the number of refrigerators, freezers, room air conditioners or space heaters that are present in the housing unit to determine the total monthly Kwh consumption for these appliances.

There may be instances where appliances are fueled by fossil fuels rather than by electricity. Table 16a provides monthly consumption (in MCF or gallons of fuel) for the most common of these.

If an appliance listed in Table 16 or Table 16a is not present in the housing unit at issue, do not include its monthly energy use when computing the total energy consumed by equipment and appliances.

2. **Cost.** The cost of electricity or fossil fuel consumed by appliances and equipment is easily computed by multiplying the total monthly consumption (as determined in the preceding paragraphs) times the appropriate charge per Kwh, MCF or gallon. These unit charges are shown in Table 17.

**TABLE 16 MONTHLY KWH USAGE: APPLIANCES AND EQUIPMENT**  
ALL REGIONS

Appliance/ Equipment	Gross Square Feet of Living Space									
	Under 301	301- 500	501- 700	701- 1,100	1,101- 1,300	1,301- 1,500	1,501- 1,900	1,901- 2,100	2,101- 2,500	Over 2,500
Hot water heater	130	130	245	245	370	370	480	480	600	705
Stove / Microwave	45	45	50	50	55	55	60	60	65	70
Refrigerator 1/	45	50	50	50	85	85	85	85	85	85
Clothes washer	20	35	35	35	45	45	45	55	55	65
Clothes dryer	15	15	25	25	35	35	35	35	40	50
Dishwasher	35	35	45	45	60	60	70	70	80	95
Freezer 1/	70	70	70	70	70	70	70	70	70	70
Furnace fan	15	15	20	20	20	25	25	30	30	35
Room air conditioner	65	65	65	65	65	65	65	65	65	65
Television / radio	5	5	10	10	20	20	20	20	25	25
Lights	50	55	75	80	90	90	95	100	120	120
Space heater (portable) 1/	130	130	130	130	130	130	130	130	130	130
Misc. small appliances	30	30	45	45	65	65	75	80	95	105
Engine Heaters	195	195	195	195	195	195	195	195	195	195
Hot Tub	360	360	360	360	360	360	360	360	360	360

1/ If more than one of these appliances are present in a housing unit, multiply the kWh consumption times the number of appliances to determine the total kWh consumed for each appliance category.

**NOTE:** FOR APPLIANCES OPERATED BY FOSSIL FUELS, SEE TABLE 16A.

**TABLE 16A MONTHLY FOSSIL FUEL CONSUMPTION: APPLIANCES AND EQUIPMENT**  
ALL REGIONS

Appliance/ Equipment	Gross Square Feet of Living Space									
	Under 301	301- 500	501- 700	701- 1,100	1,101- 1,300	1,301- 1,500	1,501- 1,900	1,901- 2,100	2,101- 2,500	Over 2,500
Hot water heater										
Natural Gas MCF	.55	.55	1.05	1.05	1.58	1.58	2.05	2.05	2.56	3.01
Propane Gallons	5.61	5.61	10.71	10.71	16.12	16.12	20.91	20.91	26.11	30.70
Fuel Oil Gallons	3.87	3.87	7.39	7.39	11.12	11.12	14.43	14.43	18.02	21.19
Kitchen Range										
Natural Gas MCF	.19	.21	.21	.21	.36	.36	.36	.36	.36	.36
Propane Gallons	1.94	1.94	2.14	2.14	2.35	2.35	2.65	2.65	2.86	3.06
Fuel Oil Gallons	1.34	1.34	1.48	1.49	1.62	1.62	1.83	1.83	1.97	2.11
Refrigerator 1/										
Natural Gas MCF	.19	.21	.21	.21	.36	.36	.36	.36	.36	.36
Propane Gallons	1.94	2.14	2.14	2.14	3.67	3.67	3.67	3.67	3.67	3.67
Clothes dryer										
Natural Gas MCF	.06	.06	.11	.11	.15	.15	.15	.15	.17	.21
Propane Gallons	.61	.61	1.12	1.12	1.53	1.53	1.53	1.53	1.73	2.14
Freezer 1/										
Natural Gas MCF	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Propane Gallons	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06
Space heater (portable) 1/										
Natural Gas MCF	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Propane Gallons	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61
Fuel oil Gallons	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87

1/ If more than one of these appliances are present in a housing unit, multiply the consumption times the number of appliances to determine the total consumed for each appliance category.

**NOTE:** To compute the cost per month for an appliance that is fueled by a fossil fuel, multiply the consumption listed by the unit cost found in Table 17 of this report.

## G. WATER AND SEWER CONSUMPTION/COST CALCULATIONS

In accordance with OMB Circular No. A-45 and Departmental policies and guidelines, when utilities are furnished by the government, charges shall be based upon regional average residential rates and consumption levels applicable to private rental housing in the survey region.

Where regional survey procedures are used to establish base rental rates, the charges for government-furnished water and sewer services must be based upon *regional average* water and sewer rates, and not the rates prevailing in the nearest established community. In determining the regional average rates, the water and sewer rates for each survey community were obtained and averaged.

Thus, where the water service is unmetered, and where the government furnishes water and sewer services, *including well water and septic waste disposal systems*, the regional average flat rate charges, shown below, shall be used. These charges are based upon (1) the average of the monthly service costs (including taxes, service charges, etc.) in all surveyed communities; and (2) consumption levels (based on numbers of bedrooms) contained in planning guides published by the Department of Housing and Urban Development (HUD). The rates below are based upon the number of bedrooms contained in a dwelling.

### Flat Rate Water and Sewer Charges

#### NORTH CENTRAL REGION

<u>Number of Bedrooms</u>	<u>Monthly Charges</u>	<u>Total</u>
1 (or less)	\$15.90 water + \$18.30 sewer	= \$34.20
2	\$21.50 water + \$25.00 sewer	= \$46.50
3	\$28.50 water + \$33.75 sewer	= \$62.25
4	\$36.00 water + \$43.00 sewer	= \$79.00

H. GOVERNMENT PROVIDED METERED UTILITIES

Where the government provides the utilities, and the consumption is metered *at the housing unit level*, the following unit charges will apply.

**TABLE 17 UTILITY CHARGES (COST PER UNIT)**

NORTH CENTRAL REGION

**Do not calculate the total cost of electricity in steps, such as the first 500 Kwh costs so much, then the second 500 Kwh costs so much, etc.**

a. <u>Electricity</u>	Kwh Consumed	
	Per Month	Charge Per Kwh
	0 – 500	\$.113
	501 – 1,000	\$.105
	1,001 – 1,500	\$.101
	Over 1,500	\$.099
b. <u>Fuel Oil #2</u>	\$2.62 Per Gallon.	
c. <u>Propane</u>	\$1.68 Per Gallon.	
d. <u>Natural Gas</u>	\$12.72 Per MCF (1,000 cubic feet).	
e. <u>Water</u>	<u>Water Consumed Per Month</u>	Cost Per <u>Gallon</u>
	1 – 3,000 Gallons	\$0.0053
	3,001 – 5,000 Gallons	\$0.0043
	5,001 – 7,500 Gallons	\$0.0038
	Over 7,500 Gallons	\$0.0036
f. <u>Sewer</u>	<u>Sewer Consumed Per Month</u>	Cost Per <u>Gallon</u>
	1 – 3,000 Gallons	\$0.0061
	3,001 – 5,000 Gallons	\$0.0050
	5,001 – 7,500 Gallons	\$0.0045
	Over 7,500 Gallons	\$0.0043

## I. GARBAGE/TRASH REMOVAL SERVICE RATES

In the case of garbage and trash hauling, as with other government-provided services, OMB Circular No. A-45 requires the charges to be based upon the domestic rates for comparable services provided to occupants of private rental units in the survey area (region).

The garbage and trash services provided to housing occupants vary from weekly to daily service. Establishment of a service charge based upon the service in the nearest established community may or may not reflect a similar level of service. Therefore, the charge for garbage and trash collection, when conducted by the government, will, regardless of housing type, be **\$14.20 per unit per month** in the North Central region.

## J. CHARGES FOR APPLIANCES AND RELATED SERVICES

OMB Circular No. A-45 requires agencies to charge occupants of government housing for appliances, furnishings and services that the government provides with the unit. The charges for appliances, furnishings and services most typically provided by federal agencies are found in Table 18. The monthly recapture cost of the items in Table 18 were determined from information gathered by contractors in the survey communities of all QMIS regions, and from special studies conducted by the QMIS Office.

Agencies providing appliances, furnishings or services that are not included in Table 18 are responsible for establishing an appropriate monthly charge that reflects the private market value of the item(s) provided. In such cases, the agency or bureau should advise the QMIS Office to ensure that subsequent regional survey reports include charges for all government-provided appliances, furnishings and services.

**TABLE 18 MONTHLY CHARGES FOR APPLIANCES & RELATED SERVICES - ALL REGIONS  
(EFFECTIVE MARCH 4, 2007)**

APPLIANCES		SERVICES AND FURNISHINGS	
Range (Gas / Electric) *	(+/-) \$3.65	Storage Shed (Per Unit)	\$2.50
Refrigerator *	(+/-) 3.30	Furniture (Per Room)	11.10
Clothes Washer	3.85	Swimming Pool	
Clothes Dryer	3.20	Private Pool	60.00
Dishwasher	3.15	Community Pool	20.00
Microwave Oven	1.20	Satellite Dish	22.00
Trash Compactor	3.65	Cable Television	28.50
Freezer	1.90	Premium Channel (Each)	19.15
Freezer (Community)	1.00	Maid Service	78.05
Window Air Conditioner		Lawncare (Per Mowing)	
Refrigerated Unit	4.05	Houses (Excluding Plexes)	24.55
Evaporative (Swamp) Unit	3.05	All Other Classes	12.35
Free Standing Stove	3.70	Snow Removal (Per Removal)	14.20
Fireplace Insert	4.40	Firewood (Per Cord)	146.05
Lawn Mower	3.75		
Hot Tub	33.40	<u>ELECTRIC CREDITS</u>	
		Well pump (0-1 Bedroom)	-1.35
Community Laundry		Well pump (2 Bedrooms)	-2.15
(Non-Coin Operated)		Well pump (3 Bedrooms)	-3.10
Washer Only	1.90	Well pump (4+ Bedrooms)	-4.25
Dryer Only	1.60		
Washer and Dryer	3.50	Sewer Lift Pump (0-1 Bedroom)	-1.35
		Sewer Lift Pump (2 Bedrooms)	-1.35
		Sewer Lift Pump (3 Bedrooms)	-1.60
		Sewer Lift Pump (4+ Bedrooms)	-2.15
ISOLATION ADJUSTMENT FACTOR	3.60	Base Radio	-1.35
		Remote Control Relay	-1.35
		Sump Pump	-1.35
		Radon Mitigation Fan	-12.60

*\*If the government provides one range and refrigerator, no additions or deductions are made.*

*\*If the government does not provide a range or a refrigerator, deduct the amount shown above.*

*\*If the government provides 2 or more ranges or refrigerators, add the amounts shown above for each appliance furnished in excess of one range and one refrigerator.*



## VII. ADMINISTRATIVE ADJUSTMENTS

Once the MBRR is established, certain adjustments (e.g. for isolation and amenity deficiencies) are authorized by OMB Circular A-45. These administrative adjustments are established by OMB and are not derived from regional surveys conducted by the QMIS Office.

The administrative adjustments contained in OMB Circular A-45, and described below, are not authorized for dormitories/bunkhouses or transient units. This is because the rental rates for those housing classes are administratively established, through extensions of the principle of comparability, and are not based directly upon market comparability.

### A. SITE AMENITY ADJUSTMENTS

Living conditions at some government housing sites are not always the same as those found in the survey communities. In the communities surveyed, the amenities discussed below (and in OMB Circular A-45) are generally present and their contributory value is included in the contract rent and in the MBRRs determined from the tables in this report. Thus, if any amenity listed below is present at the housing site, no positive adjustment is made for that amenity because its presence has already accounted for in the MBRR. However, the lack of an amenity discussed below represents a less desirable condition that should be reflected as a **negative** percentage adjustment to the MBRR or CPI-adjusted MBRR (CPI-MBRR), whichever is applicable.

1. **Reliability and adequacy of water supply.** The water delivery system at the housing site should provide potable water (free of significant discoloration or odor) and adequate pressure at usual outlets. If the water delivery system at the housing site does not meet these conditions, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.
2. **Reliability and adequacy of electric service.** Electric service at the housing site must equal or exceed a 100-ampere power system, and should provide 24-hour service under **normal** conditions. When evaluating the electric service, housing managers are reminded that OMB Circular A-45 recognizes that occasional temporary power outages are considered to be “normal” conditions. Furthermore, if an adequate back-up generator is available, then the electric service amenity will be considered to be reliable and adequate – regardless of the reliability of the primary power source. When electric service is inadequate and unreliable, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.
3. **Reliability and adequacy of fuel for heating, cooling and cooking.** There should be sufficient fuel storage capacity to meet prevailing weather conditions and needs. Where electricity is used as the heating, cooling or cooking “fuel,” an adjustment can only be made when a deduction has been made for deficient electric service (see paragraph VII.A.2, above). If the fuel delivery/storage system is inadequate, 3 percent should be deducted from the MBRR or the CPI-MBRR, whichever is applicable.
4. **Reliability and adequacy of police protection.** Law enforcement personnel, including government employees with law enforcement authority, should be available on a 24-hour basis. OMB Circular A-45 defines “availability” as the ability of law enforcement officers to respond to emergencies at the

housing site as quickly as a law enforcement officer in the nearest established community could respond to an emergency in the nearest established community.

OMB Circular A-45 further provides that where part-time officers serve the housing site, the fact that the officers are part-time does not necessarily mean that they are less available than officers in the nearest established community. The important point is that the availability determination must be based on comparative response times (housing site vs. the nearest established community) – not the employment conditions of the officers serving the housing site.

Finally, OMB Circular A-45 provides that gaps in availability due to temporary illness or injury, use of annual leave, temporary duties, training, or other short absences, do not render law enforcement personnel “unavailable” at the housing site.

If, after applying these guidelines, it is determined that the law enforcement protection at the housing site is unreliable and inadequate in comparison to the reliability and adequacy of law enforcement protection in the nearest established community, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

5. **Fire insurance availability or reliability and adequacy of fire protection.** Fire insurance should be available (for the housing) with the premium charge based upon a rating equal to the rating available to comparable housing located in the nearest established community. Alternatively, adequate equipment, an adequate supply of water (or fire retardant chemical), and trained personnel should be available on a 24-hour basis to meet foreseeable emergencies. OMB Circular A-45 provides that **if** either element is present (adequate insurance or an adequate fire fighting capability), no adjustment is authorized. If both elements are missing, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.
6. **Reliability and adequacy of sanitation service.** An adequately functioning sewage disposal system and a solid waste/refuse disposal system should be available. OMB Circular A-45 considers septic, cesspool or other systems adequate, even though they may require periodic maintenance, as long as they are usable during periods of occupancy. If the sanitation service at the housing site is unreliable or inadequate, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.
7. **Reliability and adequacy of telephone service.** Access to commercial telephone facilities should be available on a 24-hour basis. Deductions (except as provided below) are not allowed for occasional temporary interruptions of telephone service. OMB Circular A-45 allows specific deductions for various levels of service and privacy. These are explained below.
  - a. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 3 percent if telephone service is not available within the unit or within 100 yards of the unit.
  - b. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 2 percent if there is no telephone service within the unit, but telephone service (either private or party line) is available within 100 yards of the unit.

- c. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 1 percent if telephone service is available in the employee's unit, but the service is not a private line and/or the service is not accessible on a 24-hour per day basis.
8. **Noise and odors.** If there are frequent disturbing or offensive noises and/or odors at the housing site, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.
9. **Miscellaneous improvements.** One or more of the following improvements should be available at the housing site: paved roads/streets, sidewalks or street lights. If any one of these improvements is present, no deduction is authorized. If all three of these improvements are missing (i.e., there are no paved roads/streets and there are no sidewalks and there are no street lights), 1 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

## B. ISOLATION ADJUSTMENT

In some cases, government housing is located far from the nearest established community (see paragraph IX.C for the OMB's definition of "established community"). In addition, different modes of transportation (travel categories) may serve to further isolate the housing site from the nearest established community. In situations where the housing location and the travel categories meet the requirements contained in OMB Circular A-45, an isolation adjustment should be applied. To determine whether an isolation adjustment applies, and the amount of the adjustment, if applicable, you should follow the steps in the Isolation Adjustment Computation Schedule, shown on the following page. This schedule is a (modified) reproduction of the appendix to OMB Circular A-45, and is included in this report for illustrative purposes only. Therefore, you should use the form prescribed by your agency or bureau when documenting the isolation adjustment.

### Isolation Adjustment Computation

- Step 1. Determine the one-way distance in miles (from the individual unit to the nearest established community) for each category of transportation listed in Figure 1. Enter mileage(s) in the appropriated block(s) under Column B.
- Step 2. Multiply mileage figures entered in Column B by point values listed in Column A for each affected category of transportation to produce one-way points for each category. Add 29 points to the category 4 subtotal and 27 points to the category 5 subtotal to reflect relative differences in cost or time by use of these modes of travel.
- Step 3. Add all categories of one-way points in Column C to produce one-way points. (If the total does not exceed 30 points, there is no adjustment for isolation.)

**Figure 1**

<u>Category of Travel</u>	Column A <u>Point Value</u>		Column B <u>One-way Miles</u>	=		Column C <u>One-way Points</u>
(1) Paved road or rail	1.0	X	_____	=		_____
(2) Unpaved but improved road	1.5	X	_____	=		_____
(3) Unimproved road	2.0	X	_____	=		_____
(4) Water, snowmobile, pack animal, foot or other special purpose conveyance	2.5	X	_____	=	_____+29	_____
(5) Air	4.0	X	_____	=	_____+27	_____
TOTAL ONE-WAY POINTS				=		_____

- Step 4. Calculate the Isolation Adjustment Factor (IAF) using the following OMB formula: Multiply 2 (to reflect round-trip points) by 4 (to reflect number of trips per month) and then multiply by GSA's current automobile allowance per mile as of the last day of September of each year. For example, the GSA mileage allowance, as of September 30, 2006, was \$0.445 per mile, resulting in an IAF of \$3.60 per point.

ISOLATION ADJUSTMENT FACTOR = \$3.60 per point

- Step 5. Multiply total adjusted points by the Isolation Adjustment Factor to produce the monthly adjustment for isolation (rounded to the nearest whole dollar).

MONTHLY ADJUSTMENT = \_\_\_\_\_

### C. LOSS OF PRIVACY

Some occupants are subject to a loss of privacy during non-duty hours by virtue of public visits which occur several times daily. In other cases, occupants may be inhibited from enjoying the full range of activities normally associated with living in private rental housing (such as where restrictions are imposed on activities in housing at national cemeteries, or where units are in view of prison inmates). In such cases, OMB Circular A-45 allows a deduction from the MBRR or CPI-MBRR (whichever is applicable) of up to 10 percent. OMB Circular A-45 instructs housing managers to establish proportional adjustments to reflect situations of less frequency or seriousness in their impact upon privacy or usage, or to reflect seasonal variations.

### D. EXCESSIVE OR INADEQUATE SIZE

Occupants are sometimes provided dwellings that are excessively large or small for their needs. This may be because the range and variety of units available at an installation may be much less than that which is available in private rental markets. In such cases, OMB Circular A-45 allows a deduction from the MBRR or the CPI-MBRR (whichever is applicable) of up to 10 percent. The Circular instructs that the deduction should be in direct proportion to the degree of excess or inadequacy, and that the deduction must not continue beyond one month after suitable housing is made available. Before this adjustment is applied, local housing managers should consult with managers within their agencies or bureaus to determine whether other alternatives (such as closing off rooms and other excess space) would offer a more suitable means of adjustment.

### E. LIMITATIONS TO ADMINISTRATIVE ADJUSTMENTS

Administrative adjustments cannot be applied without limit. OMB Circular A-45 provides that the MBRR or CPI-MBRR cannot be reduced by more than 50 percent unless an isolation is authorized and applied. For units which receive an isolation adjustment, the MBRR or CPI-MBRR may not be reduced by more than 60 percent. These limitations do not apply to excessive heating or cooling adjustments, which are described in paragraph IX.A of this report.

## VIII. CONSUMER PRICE INDEX (CPI) ADJUSTMENTS

OMB Circular A-45 requires annual verification and adjustment (when necessary) of the following rental components that are presented in this report: (1) the Monthly Base Rental Rates (MBRRs); (2) the charges for related facilities (utilities, appliances, furnishings and services); and (3) the Isolation Adjustment Factor (IAF). These verifications and adjustments are to be made in each interim year between regional surveys.

Generally, OMB Circular A-45 specifies that these changes are to be based upon September index levels of specified components of the Consumer Price Index (CPI) and the GSA temporary duty mileage allowance in effect as of September 30 of each year. These changes must be implemented at the beginning of the first pay period in March of each following year.

The QMIS Office is responsible for determining the amounts of these changes, and for providing QMIS Rental Program participants with the information, the software, and the instructions needed to implement the required changes. This information is usually provided to each National Housing Officer in November of each year, and new CPI- and Regional Survey-adjusted rental formulas are distributed with the updated QMIS software in December each year. National, regional or installation housing managers (as required by your agency or bureau) are responsible for implementing these annual rental adjustments.

## IX. OTHER OMB CIRCULAR A-45 RENT CONSIDERATIONS

### A. EXCESSIVE HEATING OR COOLING COSTS

OMB Circular A-45 authorizes a deduction from the Monthly Base Rental Rate (MBRR) or the Consumer Price Index-adjusted Monthly Base Rental Rate (CPI-MBRR), whichever is applicable, when housing is unusually costly to heat or cool. This adjustment is allowed only when: (1) the excessive heating or cooling costs are due to the poor design of the unit or the lack of adequate insulation/weather-proofing; and (2) when the energy/fuel used for heating and/or cooling is metered. This adjustment will vary from quarter to quarter, but is the difference between the actual heating and/or cooling costs paid by the occupant and 125 percent of the cost of heating and/or cooling a comparable (but adequately constructed and insulated) dwelling located in the same climate zone. For more information on this adjustment, you should consult your agency/bureau policies, or the QMIS Office.

### B. INCREMENTAL ADJUSTMENTS

New baseline regional surveys or annual CPI adjustments may occasionally increase a unit's rent by more than 25 percent. When this occurs, OMB Circular A-45 allows housing managers to impose the increase incrementally over a period of not more than one year. The Circular also requires that such increases must be applied in equal increments on at least a quarterly basis. In effect, 25 percent of the increase is implemented during the first pay period in March; 50 percent of the increase is implemented three months later; 75 percent of the increase is implemented six months later; and 100 percent of the increase is implemented nine months later. Incremental adjustments apply only to existing tenants, and do not apply to non-federal tenants.

### C. ESTABLISHED COMMUNITY

OMB Circular A-45 has established the following minimum standards for use in determining which population centers (cities, towns, etc.) may be used as "established communities" when determining rents.

1. An established community must have a year-round population of 1,500 or more (5,000 or more in Alaska). The population determinations must be based upon the most recently conducted decennial census.
2. An established community must have at least one doctor and one dentist, who are available to all occupants on a non-emergency basis.

3. An established community must have a private rental market with housing available to the general public. This requirement excludes communities on military posts, Indian reservations and other government installations which may meet the other criteria contained in paragraphs IX.C.1 and C.2 above.