

UTILITY ALLOWANCE STUDY

CONVENTIONAL

Prepared For:

Key West Housing Authority

**1400 Kennedy Drive
Key West, Florida 33040-3079**

Prepared By:

Abbie J. Weist, Inc.

9230 Crystal View Ct.

Ft. Myers, FL 33967

abbieweist@comcast.net

With

KN Consultants, LLC

P.O. Box 1212

Safety Harbor, Florida 34695-1212

jkellype@tampabay.rr.com

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1 Basis for Utility Allowance in Public Housing

Under the provisions of the US Housing Act of 1937, as amended, HUD provides housing assistance to approximately 1.3 million households living in public housing across the country. This assistance is provided through approximately 3,100 Public Housing Agencies. HUD has responsibility for the oversight of federally assisted public housing and establishes regulations to guide these PHAs in how they implement the federal housing assistance.

In order to keep assisted housing affordable to the lower-income households, federal housing law directs that the resident's share of rent in federally assisted public housing should equal 30 percent of the household's adjusted monthly income. In interpreting the federal housing law, HUD has defined the Total Resident Payment for "rent" to include both shelter costs and the costs for reasonable amount of utilities. The amount the Housing Authority determines as necessary to cover the resident's reasonable utility cost is known as the utility allowance.

Such allowances are estimates of the expenses associated with different types of utilities and different utility uses. The utilities for which allowances may be provided include electricity, natural gas, propane, fuel oil, wood or coal, and water and sewage service, as well as trash and garbage collection. The functions, or end-uses, covered by an allowance may include space heating, water heating, cooking, refrigeration, lighting, and appliances. Note that allowances are not provided for telephone or television cable service.

Whether a household receives an allowance for a given utility service generally depends on the way the utilities are metered. Utilities can be metered in one of three ways: master-meter, check-metered, and individually metered. Allowances are provided for check-metered and individually metered utilities, but not master-metered utilities. An allowance may also be provided to residents for some non-metered utilities, because the residents pay for these services directly. Trash services are an example of a utility that is non-metered in some areas.

2 Introduction

The Key West Housing Authority maintains and operates 589 residential dwelling units, office space and storage areas at five different developments. Four of the developments, J. Y. Porter Place, Fort Village, Robert Gabriel, and George Allen, were built in the 1940's - 1950's. The fifth development, Senior Citizen Plaza was constructed in 1973.

This Utility Allowance Study was performed for the purpose of complying with Federal Register 24 CFR Part 965. These regulations apply to allowances for all applicable types of utilities, regardless on the methodology used to calculate the allowances.

The study was performed with the assistance of the Utility Allowance Guidebook published in September 1998. This study uses the engineering-based methodology, one of two suggested methods that can be used to establish utility allowances. This method is based on engineering calculations and other technical information that is used to estimate the amount of energy or water a household should reasonable require.

The tenants of J. Y. Porter Place, Fort Village, Robert Gabriel, and George Allen are responsible for individual metered electric and water utilities. The units in these developments are very similar to one another with the basic difference being the number of bedrooms. Therefore, this study recommends utility allowances for only those utilities based on the number of bedrooms for an individual unit.

Senior Citizen Plaza is master metered for both electricity and water and its residents do not qualify for an allowance since their utility costs are paid directly by the Key West Housing Authority. Those residents with air conditioners installed in their units are assessed a surcharge to pay for the electricity consumed by the air conditioner.

Sanitary Sewer is not charge to the Housing Authority residents. Non-metered utilities such as trash collection are paid for by the Housing Authority. No Utility Allowances are provided for these services.

Key West Housing Authority is unique because there are no heating degree days and no heating provided in the dwellings. In addition, air conditioning is not provided by the Housing Authority. Residents may install unit air conditioners which they purchase and are responsible for paying for its electric consumption. No utility allowance is provided for air conditioning or heating.

Another unique situation for Key West Housing Authority is that Key West, Florida has no natural gas distribution system. In addition, bottled propane is relatively expensive. Therefore, converting to an alternative energy supply is not an option.

3 Utility Allowance Recommendations

The following Utility Allowance recommendations are for residences of J. Y. Porter Place, Fort Village, Robert Gabriel, and George Allen based on the number of bedrooms. Senior Citizen Plaza is master metered for both electricity and water and paid directly by the Key West Housing Authority. Therefore no Utility Allowance is recommended for Senior Citizen Plaza.

| Monthly Utility Allowance | 1 BR | 2 BR | 3 BR | 4 BR |
|---------------------------|--------------|--------------|--------------|--------------|
| Electric | \$74 | \$84 | \$95 | \$104 |
| Water | \$45 | \$50 | \$54 | \$58 |
| Total | \$119 | \$134 | \$149 | \$162 |
| Previous | \$131 | \$149 | \$168 | \$185 |
| Increase | -\$12 | -\$15 | -\$19 | -\$23 |

4 Utilities Cost

4.1 Electricity

Monthly Electricity Cost

| Monthly Electricity Cost | 1 BR | 2 BR | 3 BR | 4 BR |
|--------------------------|----------------|----------------|----------------|-----------------|
| Customer Charge | \$26.67 | \$26.67 | \$26.67 | \$26.67 |
| Domestic Hot Water | \$20.04 | \$25.05 | \$30.06 | \$35.07 |
| Cooking | \$7.19 | \$8.57 | \$9.81 | \$10.64 |
| Refrigeration | \$9.26 | \$11.06 | \$12.99 | \$14.79 |
| Lighting | \$2.07 | \$2.49 | \$3.04 | \$3.04 |
| Miscellaneous Appliances | \$8.98 | \$10.64 | \$12.44 | \$14.24 |
| Total Electric | \$74.21 | \$84.48 | \$95.01 | \$104.45 |

4.1.1 Electric Rates

Electric utility rates are based on Keys Energy Services rates. Keys Energy Services can be reached at (305) 295-1000 or www.keysenergy.com.

Customer Charge: \$22.00 per month + Tax Adj. = \$26.67

Energy Charge (First 1,000kWh) = \$0.1382

Energy Charge (All additional kWh) = \$0.1382

4.1.2 Monthly Energy Charge

Domestic Hot Water

| Domestic Hot Water | 1 BR | 2 BR | 3 BR | 4 BR |
|------------------------|----------|----------|----------|----------|
| Electric (kWh) | 145 | 181 | 218 | 254 |
| Energy Charge (\$/kWh) | \$0.1382 | \$0.1382 | \$0.1382 | \$0.1382 |
| Energy Cost | \$20.04 | \$25.05 | \$30.06 | \$35.07 |

Cooking

| Cooking | 1 BR | 2 BR | 3 BR | 4 BR |
|------------------------|----------|----------|----------|----------|
| Electric (kWh) | 52 | 62 | 71 | 77 |
| Energy Charge (\$/kWh) | \$0.1382 | \$0.1382 | \$0.1382 | \$0.1382 |
| Energy Cost | \$7.19 | \$8.57 | \$9.81 | \$10.64 |

Refrigeration

| Refrigeration | 1 BR | 2 BR | 3 BR | 4 BR |
|------------------------|----------|----------|----------|----------|
| Electric (kWh) | 67 | 80 | 94 | 107 |
| Energy Charge (\$/kWh) | \$0.1382 | \$0.1382 | \$0.1382 | \$0.1382 |
| Energy Cost | \$9.26 | \$11.06 | \$12.99 | \$14.79 |

Lighting

| Lighting | 1 BR | 2 BR | 3 BR | 4 BR |
|------------------------|----------|----------|----------|----------|
| Electric (kWh) | 15 | 18 | 22 | 22 |
| Energy Charge (\$/kWh) | \$0.1382 | \$0.1382 | \$0.1382 | \$0.1382 |
| Energy Cost | \$2.07 | \$2.49 | \$3.04 | \$3.04 |

Miscellaneous Appliances

| Miscellaneous Appliances | 1 BR | 2 BR | 3 BR | 4 BR |
|--------------------------|----------|----------|----------|----------|
| Electric (kWh) | 65 | 77 | 90 | 103 |
| Energy Charge (\$/kWh) | \$0.1382 | \$0.1382 | \$0.1382 | \$0.1382 |
| Energy Cost | \$8.98 | \$10.64 | \$12.44 | \$14.24 |

4.2 Water**Monthly Water Cost**

| Monthly Water Cost | 1 BR | 2 BR | 3 BR | 4 BR |
|--------------------|----------------|----------------|----------------|----------------|
| Customer Charge | \$18.85 | \$18.85 | \$18.85 | \$18.85 |
| Water Charge | \$26.60 | \$30.90 | \$35.20 | \$39.50 |
| Total Water | \$45.45 | \$49.75 | \$54.05 | \$58.35 |

4.2.1 Water Rates

Water utility rates are based on Florida Keys Aqueduct Authority rates. Florida Keys Aqueduct Authority can be reached at (305) 296-2454.

| | |
|--|---------|
| Customer Charge (\$/mo): | \$18.85 |
| Water Charge 0 to 6,000 gal (\$/1000 gal): | \$7.92 |
| Water Charge 6,001 gal to 12,000 gal (\$/1000gal): | \$11.57 |

4.2.2 Monthly Water Charge

| Water | 1 BR | 2 BR | 3 BR | 4 BR |
|------------------------------------|---------|---------|---------|---------|
| Water Consumption (gal) | 3,359 | 3,902 | 4,445 | 4,988 |
| Water Charge (0 to 6,000 gal) | \$26.60 | \$30.90 | \$35.20 | \$39.50 |
| Water Charge (6,001 to 12,000 gal) | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| Total Water Charge | \$26.60 | \$30.90 | \$35.20 | \$39.50 |

5 Consumption Studies

All appliances for Conventional Key West Housing utilize electricity. Key West contains no natural gas distribution system and propane is relatively expensive.

5.1 Space Heating Consumption

Key West is located in a tropical weather location that has no heating degree days. The apartments do not require heating, therefore no allowance is provided for space heating.

5.2 Domestic Hot Water Consumption

The following monthly energy consumption requirements for domestic hot water consumption are based on calculations in HUD's Life Cycle Cost Analysis Handbook, 7418.1 CHG-1. The calculations assume the following:

| | |
|------------------------------------|-------|
| Inlet Temperature (F): | 75 |
| Outlet Temperature (F): | 120 |
| Weight of Water (LB/Gallon): | 8.33 |
| Specific Heat of Water (BTU/FxLB): | 1 |
| Heat of Electricity (BTU/kWh): | 3,412 |
| Heat Lost from Tank and Piping: | 10% |

Monthly Energy Consumption Requirements for Domestic Hot Water

| Domestic Hot Water | 1 BR | 2 BR | 3 BR | 4 BR |
|-----------------------|---------|---------|---------|---------|
| Consumption (Gal/day) | 40 | 50 | 60 | 70 |
| Energy (BTU's) | 494,802 | 618,503 | 742,203 | 865,904 |
| Electricity (kWh) | 145 | 181 | 218 | 254 |

5.3 Cooking Consumption

The following is the monthly energy consumption requirements for cooking as recommended in the Utility Allowance Guidebook:

Monthly Energy Consumption Requirements for Cooking

| Cooking | 1 BR | 2 BR | 3 BR | 4 BR |
|-------------------|------|------|------|------|
| Electricity (kWh) | 52 | 62 | 71 | 77 |

5.4 Refrigeration Consumption

The following is the monthly energy consumption requirement for refrigeration. The consumption data is based on an automatic defrost refrigerator/freezer consuming 800 kWh per year for a one bedroom apartment per the Edison Electric Institute. It was assumed that the refrigerator/freezer consumed 20% more energy for each additional bedroom.

Monthly Energy Consumption Requirements for Refrigeration

| Refrigeration | 1 BR | 2 BR | 3 BR | 4 BR |
|-------------------|------|------|------|------|
| Electricity (kWh) | 67 | 80 | 94 | 107 |

5.5 Lighting Consumption

The following is the monthly energy consumption requirement for lighting. The consumption

Monthly Energy Consumption Requirements for Lighting

| Lighting | 1 BR | 2 BR | 3 BR | 4 BR |
|-------------------|------|------|------|------|
| Electricity (kWh) | 15 | 18 | 22 | 22 |

The following assumptions for lighting usage were developed to estimate the monthly energy

| <u>Lighting Location</u> | <u>Daily Usage (Hours)</u> |
|--------------------------|------------------------------------|
| Kitchen/Dining | 4 |
| Bathroom | 3 |
| Hallway/Foyer | 2 |
| Living Room | 5 |
| Bedroom | 4 |

Development: Joseph Y. Porter Place

Number of Bedrooms: 1

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|--------------------------|
| Kitchen/Dining | 2 | 13 | 4 | 3.12 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hallway/Foyer | 2 | 13 | 2 | 1.56 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 2 | 13 | 4 | 3.12 |
| Total | | | | 12.87 |

Development: Joseph Y. Porter Place

Number of Bedrooms: 2

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 4 | 13 | 4 | 6.24 |
| Total | | | | 18.33 |

Development: Joseph Y. Porter Place

Number of Bedrooms: 3

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 6 | 13 | 4 | 9.36 |
| Total | | | | 21.45 |

Development: Fort Village

Number of Bedrooms: 1

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 2 | 13 | 4 | 3.12 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 2 | 13 | 2 | 1.56 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 2 | 13 | 4 | 3.12 |
| Total | | | | 12.87 |

Development: Fort Village

Number of Bedrooms: 2

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 4 | 13 | 4 | 6.24 |
| Total | | | | 18.33 |

Development: Fort Village

Number of Bedrooms: 3

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 6 | 13 | 4 | 9.36 |
| Total | | | | 21.45 |

Development: Robert Gabriel

Number of Bedrooms: 2

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 3 | 13 | 4 | 4.68 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 4 | 13 | 4 | 6.24 |
| Total | | | | 16.77 |

Development: Robert Gabriel

Number of Bedrooms: 3

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 5 | 13 | 4 | 7.8 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Hall/Foyer | 2 | 13 | 2 | 1.56 |
| Bedroom | 6 | 13 | 4 | 9.36 |
| Total | | | | 23.79 |

Development: George Allen

Number of Bedrooms: 1

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 4 | 13 | 5 | 7.8 |
| Bedroom | 2 | 13 | 4 | 3.12 |
| Total | | | | 19.11 |

Development: George Allen

Number of Bedrooms: 2

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 2 | 13 | 2 | 1.56 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 4 | 13 | 4 | 6.24 |
| Total | | | | 19.11 |

Development: George Allen

Number of Bedrooms: 3

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 4 | 13 | 4 | 6.24 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 1 | 13 | 2 | 0.78 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 6 | 13 | 4 | 9.36 |
| Total | | | | 21.45 |

Development: George Allen

Number of Bedrooms: 4

| Location | Number of Lamps | Lamp Size (Watts) | Daily Usage (Hours) | Monthly Energy Consumption (kWh) |
|----------------|-----------------|-------------------|---------------------|----------------------------------|
| Kitchen/Dining | 2 | 13 | 4 | 3.12 |
| Bathroom | 1 | 13 | 3 | 1.17 |
| Hall/Foyer | 2 | 13 | 2 | 1.56 |
| Living Room | 2 | 13 | 5 | 3.9 |
| Bedroom | 8 | 13 | 4 | 12.48 |
| Total | | | | 22.23 |

Monthly Lighting Energy Consumption for Each Development and Average

| Lighting (kWh) | 1 BR | 2 BR | 3 BR | 4 BR |
|--------------------|-------|--------|--------|-------|
| J. Y. Porter Place | 12.87 | 18.33 | 21.45 | N/A |
| Fort Village | 12.87 | 18.33 | 21.45 | N/A |
| Robert Gabriel | N/A | 16.77 | 23.79 | * |
| George Allen | 19.11 | 19.11 | 21.45 | 22.23 |
| Average | 15.0 | 18.135 | 22.035 | 22.23 |

* A four bedroom apartment for Robert Gabriel was not surveyed.

5.6 Miscellaneous Appliances Consumption

The following is the monthly energy consumption requirement for miscellaneous appliances. The consumption data is based on an apartment having items such as a hand iron, coffee maker, microwave, toaster, hair dryer, home computer, radio, television, VCR/DVD, clock and vacuum cleaner. It was assumed that miscellaneous items consumed 65 kWh per month for a one bedroom and 20% more energy for each additional bedroom. The consumption data below is based on estimated annual electric consumptions for household appliances published by the Edison Electric Institute.

| <u>Appliance</u> | <u>Annual Consumption kWh</u> |
|------------------|-------------------------------|
| Hand Iron | 50 |
| Coffee Maker | 80 |
| Microwave | 120 |
| Toaster | 35 |
| Hair Dryer | 45 |
| Home Computer | 125 |
| Radio | 35 |
| Television | 200 |
| VCR/DVD | 40 |
| Clock | 17 |
| Vacuum Cleaner | 27 |
| Total | 774 |

Monthly Energy Consumption Requirements for Miscellaneous Appliances

| Miscellaneous Appliances | 1 BR | 2 BR | 3 BR | 4 BR |
|--------------------------|------|------|------|------|
| Electricity (kWh) | 65 | 77 | 90 | 103 |

5.7 Water Consumption

The following is the monthly energy consumption requirements for water consumption based on the Water Consumption Study dated July 10, 2022.

Monthly Water Consumption

| Monthly Water Consumption | 1 BR | 2 BR | 3 BR | 4 BR |
|---------------------------|-------|-------|-------|-------|
| Water (Gal) | 3,359 | 3,902 | 4,445 | 4,988 |