Walk-Through Energy Survey

(Revised 01/01/07 - NYC Hub)

This survey is designed to assist the owner in assessing the energy conservation needs of the property. If the answer to a question appears in bold type, it will indicate an area where conservation measures may be needed. Each question also provides a reference number, which can assist an owner in presenting measures that may be taken to correct the problem and increase the energy efficiency of the propety.

If you are required to submit an Energy Conservation Plan for HDD approval, you should complete this survey and include it with your plan to address energy inefficiencies at your project. You should also update this survey and your HDD-approved Energy Conservation Plan every five years and maintain a copy of both on site at your project.

General Building Data

Number of Floors in Building	Number of Dwelling Units	Floor Area of Building (sq. ft.)

Orientation of Building (sketch below in the space provided a plan view of the building with an arrow indicating North)

Walls–Construction. Check any items that describe the walls in this building.

☐ Wood frame ☐ Cavity wall ☐ Concrete wall ☐ Brick veneer ☐ Aluminum, vinyl siding ☐ Wood siding

Are walls insulated? ☐ Yes ☐ No If No, Ref. No. E.2

Roof–Construction. Check any items that describe the roof in this building.

☐ Flat ☐ Wood frame ☐ Pitched ☐ Concrete

Is roof insulated? ☐ Yes ☐ No If No, Ref. No.E.2

Basement

Is any part of the building built on a concrete slab? ☐ Yes ☐ No

Is basement heated? ☐ Yes ☐ No If Yes, Ref. No. E.2

Is floor insulated over unheated basement or slab? ☐ Yes ☐ No If No, Ref. No. E.2

Apartment– The assumption made is that one apartment is representative of all the apartments in the entire complex. Size of apartment is unimportant. Therefore, a survey of one typical apartment is usually adequate to fill out the survey and can represent the aggregate opportunities for energy savings. If this assumption is incorrect for your particular complex, a survey should be filled out for each type of apartment. The typical apartment selected for the survey should be the one farthest from the heating plant.

Apartment No. _____

Inspect Apartment Door–If any apartment door opens to the outdoors, complete this section of the survey.

Is storm door installed? ☐ Yes ☐ No If No, Ref. No. E.3

Check condition of door weatherstrip (Good weather stripping is not dried or cracked and seals space between door and frame completely.) ☐ Good ☐ Bad If Bad, Ref. No. E3, E4

Does door fit tightly to frame when closed? (No large gaps at top, bottom, or sides of door.) ☐ Yes ☐ No If No, Ref. No. E.4

If automatic, does door close quickly and completely? ☐ Yes ☐ No If No, Ref. No. E.4

Inspect Apartment Windows–Type of windows:

☐ Sliding ☐ Hinged (Awning or Hopper) ☐ Casement ☐ Double Hung ☐ Fixed ☐ Other: _____

Are storm windows installed? ☐ Yes ☐ No If No, Ref. No. E.3

Window frame materials:

☐ Aluminum ☐ Vinyl ☐ Wood ☐ Other

Are windows double glazed? ☐ Yes ☐ No If No, Ref. No. E.3

Are windows in good repair?		
Weatherstripping	☐ Good ☐ Bad	
Putty	☐ Good ☐ Bad	If Bad or Loose,
Caulking	☐ Good ☐ Bad	Ref. No. E.3, E.4
Fit of windows	☐ Tight ☐ Loose	

Inspect Apartment Heating and Cooling— Type of Heating Units Installed:

☐ Radiator ☐ Wall Furnace ☐ Electric Baseboard ☐ Forced Air

Do shut-off valves operate properly?	☐ Yes ☐ No	If No, Ref. No. H.5
Do air vents on radiators operate properly?	☐ Yes ☐ No	If No, Ref. No. H.5
Is there a thermostatic control valve in this apartment?	☐ Yes ☐ No	If No, Ref. No. H.6
Does it have a set-back?	☐ Yes ☐ No	If No, Ref. No. H.6
Is thermostat located on an interior wall?	☐ Yes ☐ No	If No, Ref. No. H.6

Are there any window-mounted air conditioners?	☐ Yes ☐ No	If Yes, Ref. No. E.4
If so, do the units have covers?	☐ Yes ☐ No	If No, Ref. No. E.4
Are there any removable panels or through-the-wall sleeves for air conditioners?	☐ Yes ☐ No	If Yes, Ref. No. E.4

Inspect Apartment Hot Water.

Are any faucets or showerheads leaking or dripping?	☐ Yes ☐ No	If Yes, Ref. No. W.3
Are low-flow showerheads installed in showers?	☐ Yes ☐ No	If No, Ref. No. W.1
Are flow restricting aerators installed on all faucets?	☐ Yes ☐ No	If No, Ref. No. W.1
Does the apartment have its own hot water heater? If Yes, answer the following questions:	☐ Yes ☐ No	
Measure and record temperature of hot water. This can be done by filling a glass with hot water and measuring with thermometer.	Temperature _____	Ref. No. W.3
Does the water heater have an insulating blanket?	☐ Yes ☐ No	If No, Ref. No. W.3

Inspect Apartment Exhaust Ventilation

Is there an exhaust fan or grill in bathroom?	☐ Yes ☐ No	Ref. No. H.4
If Yes, is air exhausted continuously?	☐ Yes ☐ No	If Yes, Ref. No. H.4
Is there a vent damper installed?	☐ Yes ☐ No	If No, Ref. No. H.4
Is there an exhaust fan or grill in the kitchen?	☐ Yes ☐ No	
If Yes, is air exhausted continuously?	☐ Yes ☐ No	If Yes, Ref. No. H.4
Is there a vent damper installed?	☐ Yes ☐ No	If No, Ref. No. H.4

Inspect Apartment Lighting

What type of lighting is in the kitchen?	☐ Fluor. ☐ Incand.	If Incand.,
What type of lighting is in the bathroom?	☐ Fluor. ☐ Incand.	Ref. No. L.2

Common Areas: Entrance, Lobby, Stairwell and Corridor. The general assumption made is that the common areas are typical throughout the building. Therefore, only one survey need be filled out and will be representative of the conditions that exist in all the corridors throughout the site.
If this assumption is incorrect for your particular complex, a survey should be filled out for each unique area.

Inspect Corridor and Stairwell Windows

Type of windows:

☐ Sliding ☐ Hinged (Awning or Hopper) ☐ Casement ☐ Double Hung ☐ Fixed ☐ Other: _____

Are storm windows installed?	☐ Yes ☐ No	If No, Ref. No. E.3

Window frame material:

☐ Aluminum ☐ Vinyl ☐ Wood ☐ Other _____

Do windows have multiple panes?	☐ Yes ☐ No	If No, Ref. No. E.3
Are windows in good repair?	☐ Yes ☐ No	
Weatherstripping	☐ Good ☐ Bad	If No, Bad, or
Putty	☐ Good ☐ Bad	Loose,
Caulking	☐ Good ☐ Bad	Ref. No. E.3, E.4
Check fit of windows	☐ Tight ☐ Loose	

Inspect Interior Doors (other than apartment)

Do doors close automatically?	☐ Yes ☐ No	
Do doors close quickly and tightly?	☐ Yes ☐ No	If No or Bad,
What is condition of weatherstripping?	☐ Good ☐ Bad	Ref. No. E.4

Inspect Common Area Lighting-Add up the total watts of incandescent and fluorescent lighting in each area. Ref. No. L.2

	Incandescent (watts)	Fluorescent (watts)
Entrance		
Lobby		
Stairwell		
Corridor		
Total		

Are the diffusers (lamp covers) in good condition?	☐ Yes	☐ No	If No, Ref. No. L.3
Are lights near windows shut off during daytime?	☐ Yes	☐ No	If No, Ref. No. L.1
Is hall lighting bright or dim?	☐ Bright	☐ Dim	If Bright, Ref. No. L.1
Are the walls painted or papered with light colors?	☐ Yes	☐ No	If No, Ref. No. L.3
Are all or some lights controlled automatically? If so, type of control: ☐ Clock ☐ Photocell ☐ Other	☐ Yes	☐ No	If No, Ref. No. L.1

Inspect Corridor and Stairwell Heating

Is corridor heated?	☐ Yes	☐ No	If Yes, Ref. No. H.7
Are controls provided to limit the amount of deliverable heat? (Manual valves, thermostatic valves.)	☐ Yes	☐ No	If No, Ref. No. H.7
What is the thermostat setting? ____ Deg. F.			Ref. No. H.7
Are controls operable?	☐ Yes	☐ No	If No, Ref. No. H.7
Is stairwell heated?	☐ Yes	☐ No	If Yes, Ref. No. H.7
Are controls provided to limit the amount of deliverable heat? (Throttle valves, thermostatic valves.)	☐ Yes	☐ No	If No, Ref. No. H.7
What is the thermostat setting? ____ Deg. F.			Ref. No. H.7
Are controls operable?	☐ Yes	☐ No	If No, Ref. No. H.5

Inspect Lobby and Entrance Door

Does outside entrance door open into a vestibule?	☐ Yes	☐ No	If No, Ref. No. E.3
Type of Door: ☐ Single ☐ Double ☐ Revolving ☐ Other: ____			
Do doors close automatically?	☐ Yes	☐ No	If No, Ref. No. E.4
Do doors close quickly and tightly?	☐ Yes	☐ No	If No, Ref. No. E.4
Do doors fit tightly to frame when closed? (No large gaps on top, bottom or sides of door.)	☐ Yes	☐ No	If No, Ref. No. E.4
Condition of weatherstrip:	☐ Good	☐ Bad	If Bad, Ref. No. E.4

Inspect Lobby Heating

Are controls provided to limit the amount of deliverable heat?	☐ Yes	☐ No	If No, Ref. No. H.7
Type of Control: ☐ Throttle valve ☐ Thermostatic valve			
What is the thermostat setting? ____ Deg. F.			
Are controls operable?	☐ Yes	☐ No	If No, Ref. No. H.5

Heating Plant

Make this survey on a day when the heating plant is operating.
Walk around the equipment and observe the various items as instructed by the survey.
Spend adequate time to watch the items operate through their full cycle (dampers, linkages, etc.).
Spend enough time to make sure you are looking at the item called for in the question.

General

Source of Heating Energy:
☐ Hot Water ☐ Steam ☐ Electric Resistance ☐ Forced Air ☐ Other

Boiler Type
☐ Fire Tube ☐ Water Tube ☐ Electric Resistance ☐ Other

Fuel Used:
☐ Oil No. _____ ☐ Natural Gas ☐ Electric

Burner Type
☐ Rotary Cup ☐ Pressure Atomized ☐ Air Atomized ☐ Steam Atomized

Observe (Exterior of Heating Plant)—With the boilers firing on a typical heating day, note the following:

Is there more than one boiler?	☐ Yes	☐ No	
If so, do two or more fire up and shut down at the same time?	☐ Yes	☐ No	If Yes, Ref. No. H.1
Does boiler frequently cycle on and off? (About 5 minutes on and five minutes off.)	☐ Yes	☐ No	If Yes, Ref. No. H.2
Is a hot boiler kept on "standby"?	☐ Yes	☐ No	If Yes, Ref. No. H.1
Is boiler insulation cracked or missing?	☐ Yes	☐ No	If Yes, Ref. No. H.2
Are doors and access holes sealed tightly?	☐ Yes	☐ No	If No, Ref. No. H.2
Is there an automatic flue damper installed in each boiler breaching?	☐ Yes	☐ No	If No, Ref. No. H.2
Does the flue damper operate properly? (Open prior to firing, close when boiler shuts down.)	☐ Yes	☐ No	If No, Ref. No. H.2
Is there a barometric damper installed in the main breaching?	☐ Yes	☐ No	If No, Ref. No. H.2
Does the barometric damper swing freely?	☐ Yes	☐ No	If No, Ref. No. H.2
Does the secondary air damper operate properly? (It should close at shutdown and open during firing.)	☐ Yes	☐ No	If No, Ref. No. H.2

How is boiler operation controlled?
☐ Pressure only ☐ Interior thermostat ☐ Interior/exterior thermostat ☐ Variable temperature reset

Is the heating system provided with:

☐ Flue gas analyzer ☐ Temperature gauges ☐ Draft gauges

Do gauges operate properly? ☐ Yes ☐ No If No, Ref. No. H.1

What is the present combusion efficiency?

☐ Greater than 80% ☐ Less than 80% ☐ Don't know

Check the fuel supply and burner operation

Is the fuel oil preheated? Temperature: ____ ☐ Yes ☐ No If No, Ref. No. H.2

Is the combustion air preheated? ☐ Yes ☐ No If No, Ref. No. H.2

Are there any fuel leaks on fuel supply and return lines? ☐ Yes ☐ No If Yes, Ref. No. H.1

Are oil strainers clean? ☐ Yes ☐ No If No, Ref. No. H.1

Is the burner nozzle or rotary cup cleaned and inspected regularly? ☐ Yes ☐ No If No, Ref. No. H.1

Does burner modulate (vary the firing rate) automatically? ☐ Yes ☐ No If No, Ref. No. H.2

Open the flame inspection plate and observe

Does flame fill firebox? ☐ Yes ☐ No If No, Ref. No. H.1

Does flame impinge (touch) wall of firebox? ☐ Yes ☐ No If Yes, Ref. No. H.1

Is flame clean (no smoke at flame tips)? ☐ Yes ☐ No If No, Ref. No. H.1

Observe the operation of all linkages to assure proper operation.

Is boiler water chemically treated? ☐ Yes ☐ No If No, Ref. No. H.1

How are chemicals added:

☐ Manually ☐ Automatically

Observe (Interior of boiler) Open up the access doors of the boiler after it has cooled down and with power shut off.

Are walls and corners of firebox blackened by soot? ☐ Yes ☐ No If Yes, Ref. No. H.1

Is there any unburned oil in the firebox? ☐ Yes ☐ No If Yes, Ref. No. H.1

Check and measure the average soot thickness accumulated on the fireside of the boiler: ____

Are turbulators installed? (Fire tube only) ☐ Yes ☐ No If No, Ref. No. H.2

Check and measure (at a convenient time) the thickness of waterside scale: ____

Distribution and Piping System—Inspect all steam and hot water pipes and fittings for condition of insulation. Record all missing insulation. Ref. No. H.6

Location	Type of Pipe		Pipe Diameter	Uninsulated Length
	Hot Water?	Steam?		

Inspect all steam and hot water fittings for leaks. Record location of all leaks found. Ref. No. H.5

Are steam traps serviced annually? ☐ Yes ☐ No If No, Ref. No. H.5

Does steam come out of condensate tank vents? ☐ Yes ☐ No If Yes, Ref. No. H.5

What is the reading on the condensate return vacuum gauge? ____

Is this reading below minimum recommended by manufacturer of system? ☐ Yes ☐ No If Yes, Ref. No. H.5

On hot air systems, are joints in ductwork taped to prevent leakage? ☐ Yes ☐ No If No, Ref. No. H.5

Inspect ducting for missing insulation and record in table below. Ref. No. H.5

Location	Duct Size	Uninsulated Length

Domestic Hot Water

How is hot water heated?

☐ Same boiler used to heat building ☐ Separate hot water heater

If separate heater, what type of fuel? ☐ Oil ☐ Gas ☐ Electric

What is the recovery rate? ☐ gallon per hour Deg. F rise ____

If space heating boiler is used for domestic hot water, how is water heated? Ref. No. W.3

☐ Tankless coil ☐ steam heat exchanger ☐ immersed coil ☐ water heat exchanger

What temperature is water heated to? ____ Deg. F

Is hot water circulated? ☐ Yes ☐ No If Yes, Ref. No. W.3

If so, is circulation continuous? ☐ Yes ☐ No If No, Ref. No. W.3

What is the size and storage capacity of tanks?

Capacity ____ gallons

Note thickness and condition of storage tank insulation

Needs repair ☐ Yes ☐ No If Yes, Ref. No. W.3

No insulation ☐ Yes ☐ No If Yes, Ref. No. W.3

Less than ____ inches

Roof— Inspect the general conditions of the roof and its equipment and answer the following questions:

Are there any gaps or openings from which interior air can escape (such as open or missing doors or windows, holes, other openings)? ☐ Yes ☐ No If Yes, Ref. No. E.2

Are there any skylights? ☐ Yes ☐ No If Yes, Ref. No. E.3

Is weatherstripping on all roof doors? ☐ Yes ☐ No If No, Ref. No. E.4

Inspect any air intake ducts found on the roof:

Does each have a damper? ☐ Yes ☐ No If No, Ref. No. H.4

If so, do the dampers fit tightly? ☐ Yes ☐ No If No, Ref. No. H.4

Condition of filters: ☐ Clean ☐ Dirty If Dirty, Ref. No. H.4

Control: ☐ Man. ☐ Auto. If Man., Ref. No. H.4

Are there any roof air exhaust fans? If so, describe them (building plans or architectural drawings will be useful for this description): ☐ Yes ☐ No If Yes, Ref. No. H.4

Control: ☐ Man. ☐ Auto. If Man., Ref. No. H.4

Flow Rate:

Hours operated per day:

Exterior Building

Do exterior walls contain cracks and/or gaps that are not caulked? Check in particular window and door frames, and at the foundation. ☐ Yes ☐ No If Yes, Ref. No. E.4

Exterior and Parking Area Lighting—Inspect all exterior lighting for which the building owner is responsible. Count the fluorescent and incandescent bulbs in each place and fill out the chart below. Ref. No. L.2

	Incandescent	Fluorescent/Mercury Vapor	High Pressure Sodium
Building exterior			
Parking area			

Control: ☐ Always on ☐ Photocell ☐ Timeclock Ref. No. L.1

Laundry Room

Are washing machines installed? If so, how many? ____ ☐ Yes ☐ No If Yes, Ref. No. W.2

What temperature water does washer use? ☐ Cold ☐ Hot or Warm Ref. No. W.2

Is there an exhaust fan ☐ Yes ☐ No If Yes, Ref. No. W.2

Dryer fuel type: ☐ Nat. Gas ☐ Elec. If Elec., Ref.No. W.2

Special Facilities—Fill out a separate sheet for each special facility area.

Type of Facility: _____

Is area heated and separately controlled? ☐ Yes ☐ No If No, Ref. No. H.7

If so, are controls provided to shut off system when not in use? ☐ Yes ☐ No If No, Ref. No. H.7

What type of lighting is used? ☐ Fluor. ☐ Incand. If Incand., Ref. No. L. 2

The following energy conservation measures (ECMs) are separated into four categories: Lighting, Envelope, HVAC, and Domestic Hot Water. Within each of these categories the ECMs are ranked by priority and ease of implementation. Since measures vary considerably in expense, the efficacy of a given measure (e.g. double glazed windows) will vary by climate. When there is doubt about the best retrofits to be done for a given building, a qualified auditor should be employed to calculate the payback times for the various retrofits. To assist in this decision, each ECM has been tagged with a symbol. Those marked with a filled circle (•) should be implemented immediately if the walk through audit indicates that they are needed. Those marked with ah open circle (O) should not be implemented until a more detailed audit has been performed and at least a simple payback has been calculated.

E-Envelope

E.1 General

- • Adapt vegetation to save energy. Trees and bushes on the south and west side of the building should allow sun to reach the building in winter and shade the building in summer.
- o Use light exterior wall and roof colors to reduce cooling loads.

E.2 Walls, Roof, and Floor

- o Insulate roof: add insulation in attic by blowing, pouring or installing batts. Upgrade insulation of flat roofs externally.
- o Insulate all exterior walls by blowing in insulation or by adding batts or insulating board externally.
- o Insulate floors above unheated basement/crawl space.

E.3 Windows and Doors

- • Window repair: Repair broken glazing, maintain latches, etc.
- • Cover, seal off, and/or insulate windows that are not necessary for ventilation or day-lighting.
- o Install window film on glazing with excessive solar heat gain to limit local overheating and glare.
- o Install temporary or permanent storm windows on single glazed windows.
- o Replace poorly designed entry doors with revolving doors, vestibules, or insulated doors.
- o Install double glazed windows with low emissivity glass.

E.4 Infiltration

- • Adjust/install automatic door closers.
- • Repair/install weatherstrip on all doors and windows.
- • Install covers on window air-conditioning units.
- o Close convective paths in shafts and stairwells

H-HVAC

H.1 Boiler maintenance

- • Shut boiler plant off when heating is not required. Shut off pilot if boiler will not be used for a long time.
- • Adjust number of on-line boilers to meet the heating load: Turn off boilers as load reduces and isolate them hydraulically to avoid the standby losses.
- • Check for scale buildup on water side. Chemically treat boiler water to preclude the need for regular cleaning.
- • Check for soot buildup on fireside. Soot removal should be part of normal monthly maintenance.
- • Tune up boiler, adjust air-fuel ratio for highest combustion efficiency.

H.2 Boiler retrofits

- • Install/repair boiler insulation. Make sure not to block the combustion air intake.
- • Install/check flue dampers.
- o Install turbulators in fire tube boilers.
- o Decrease firing rate of burner or install smaller burner if high flue gas temperatures or frequent cycling indicate oversized equipment.
- o Install more efficient burner. Multi-stage or modulating burner, electronic ignition, air rather than steam atomization.

H.3 Heatpumps/Air-conditioners

- • Eliminate leaks and maintain full charge of refrigerant.
- o Reduce auxiliary equipment power consumption-This should be no more than 10% of total consumption. Check that crank case heaters have thermostatic or compressor lock-out. Timer initiated defrosting causes unnecessary cycling and should be replaced with demand control.

H.4 Ventilation

- • Install/repair back-draft or positive closure vent dampers in exhaust systems.
- • Wire exhaust fans to light switches so that fans will work only when lights are on and the room is occupied.

H.5 Distribution System Maintenance

- • Repair leaks in pipes, valves, and duct distribution systems
- • Reduce pressure drops in ducts: Remove dirt, clean filters, install turning vanes, eliminate long runs of flexible ductwork, etc.
- • Check/replace steam traps
- • Check that circulation hot water systems are operating at positive pressure, especially at upper floor radiators. Maintain proper water level in expansion tank and bleed air from system.
- o Balance steam system.

H.6 Distribution System Retrofits

- • Add insulation, especially the reflecting type behind radiators on exterior walls.
- • Install/repair insulation on steam lines and ducts. All leaks must be repaired first.
- o Convert single pipe open loop steam system to condensate return system.

H.7 Control

- • Inform and instruct tenants on the correct use of thermostats, radiator set points, window blinds, lights, etc. This needs to be repeated at regular intervals to maintain effectiveness. Supply a short instruction manual.
- • Check thermostat settings, location, and calibration. Check anticipator for proper operation.
- • Install timers to control heat in unoccupied areas such as laundry rooms, recreations rooms, and community rooms.
- o Check/install setback (clock) thermostats.
- o Replace radiator valves with radiator thermostatic valves. Equipment with sensor separate from the valve are preferred. Avoid placing sensors close to windows, in drafts, or in the sun.

- o Install temperature reset controls to reset the circulated hot water temperature in response to outside temperature.

L-Lighting

L.1 Reduce Lighting Levels

- • Remove bulbs in overlit areas.
- • Replace 40-watt fluorescent bulbs with 34-watt bulbs.
- o Remove two tubes in four-tube fluorescent fixtures. Make sure to remove or disconnect the related ballast.
- o Add separate switching to common areas that receive sufficient daylight.
- o Install photo-cells and/or time clocks on outdoor lighting fixtures and indoor lighting fixtures which receive sufficient daylight.
- o Install occupancy sensors or timers in common areas that are used sporadically such as recreation rooms, laundry rooms, and administration areas.

L.2 Increase Lighting Efficiency

- • Replace multiple small wattage incandescent with one large bulb, such as replacing two 60-watt bulbs with a single 100-watt.
- • Convert incandescent exit lights to fluorescent (special exit light retrofit kits are available).
- • Convert incandescent bulbs to fluorescent bulbs. In apartments this is best done with screw-in compact fluorescent. In common areas, consider replacing the existing fixtures with plate fixtures with separate ballasts to deter theft.
- • Replace outdoor incandescent and mercury bulbs with high pressure sodium (HPS). This measure is not appropriate in areas that are switched on-and-off more than once every half hour since HPS lamps require time to restrike.
- o Replace standard fluorescent fixture with T8 bulbs, electronic ballasts, and/or specular reflectors.

L.3 Maintenance

- • Set up regular fixture cleaning including cleaning and checking of all luminaire components. Should be done at least every 2000 operating hours.
- • Implement scheduled relamping of all common area fluorescent based on the lamp life limit as specified by the manufacturer.
- • Regularly check time clocks, photocells and control. Maintenance personnel should also monitor lighting and occupancy of common areas and suggest additional areas for controls.
- • If wall painting or carpet replacement is needed, recommend lighter colors. (Note: Avoid carpet colors which are easily soiled.)

W-Domestic Hot Water

W.1 Apartment

- • Install low-flow showerhead (flow <2.5 gpm). Flow restrictors are not recommended as they do not provide adequate results and are removed by tenants.
- • Install flow restricting aerators on all faucets.

W.2 Laundry

- • Supply appropriate detergents for cold water washing.
- • Retrofit washers for cold rinse cycle only.
- o Install local hot water booster so that the supply water temperature can be lowered.

W.3 Central

- • Repair all leaks
- • Reduce water temperature to satisfy the tenants farthest from the boiler. Reduce temperatures 5° F at a time since lower temperatures will reduce the amount of usable hot water available. A temperature of 100° F delivered is sufficient if there are not automatic dishwashers in the apartments.
- • Insulate hot water storage tank with a minimum of 3 inches of insulation.
- • Insulate distribution piping in recirculating systems with 1/2 inch of insulation.
- • Add time clock to shut off recirculation system pumps during low demand periods.
- o Install separate DHW heater in combined space heating and DHW systems.
- o Add solar system.