

## Performance Path Calculator

### Version 1.2

The following worksheets detail the information regarding the recommended scope of work and document the achievement of the 15% Performance Target. Some cells are protected to prevent accidental over-writing of formulas.

Note that throughout these worksheets, common information from cells are linked and should automatically update. Only cells shaded in blue need to be entered manually. Entering values into white or orange cells will override pre-determined formulas.

#### Basic Info

In blue cells only, enter the basic information about the building (number of units, square footage of the apartments and commercial spaces, type of garage (if applicable) and indicate the level of space conditioning in each zone). All other square footages will auto-fill after completion of the Interior Lighting worksheet.

#### Reporting Summary

In blue cells only, enter general information about the project, the model and specifics about the ASHRAE compliant components of the Baseline Building and the energy efficient components in the Proposed Design.

#### SIR by Measure

Although not required by the EPA to earn the ENERGY STAR, if incremental costs are entered, this worksheet can be used to determine the cost effectiveness for each recommended measure and for the project as a whole.

#### Windows eQUEST

For eQUEST users only, this calculates the Shading Coefficient for entry into eQUEST and modifies the NFRC U-factor to exclude the air-film.

#### Water Savings

By entering data in blue cells only, this worksheet will calculate the water savings in gallons based on the proposed flow rates entered. This information does not affect the Performance Rating but can be used when calculating SIR to justify measures that reduce consumption of water.

#### DHW Demand

Enter in occupancy usage characteristic (low/medium/high) and information about the appliances that consume water in the building. You must enter data in the Basic Info and Water Savings tab, prior to this tab.

#### Appliances

Enter data in blue cells. Values are calculated in W/Sf or kWh/yr for entry into software.

#### Lighting Schedule

Developed for eQUEST users, but can be used with other software to translate total operating hours/day into an hourly schedule that meets the requirements from the Simulation Guidelines.

#### In-Unit Lighting

Enter details and counts of installed lighting fixtures in apartments only. Square footage not illuminated by these fixtures will have a default lighting power density of 1.1 W/Sf assigned to both baseline and proposed. Installed fixtures in rooms where supplemental light will be provided by the occupant or through switched outlets, shall not be modeled as providing illumination for the entire room. Overall lighting power density is calculated on this worksheet for input into software.

#### Interior Lighting

Using floor plans, a lighting schedule, and lighting cut sheets, fill in the details of this worksheet. This will sum the square footages by ASHRAE space type for reporting purposes on the Basic Info tab, and calculate the lighting power density to be modeled per room. It also provides the maximum wattage allowed by ASHRAE 90.1 for that room, which can be more useful to the design team than the lighting power density. To help project compliance with program Prerequisites, zones are highlighted in red that exceed ASHRAE LPD's by more than 20%, which reduce the energy savings of the building, as well as zones that have insufficient illumination.

#### Exterior Lighting

Enter details in blue cells only on exterior areas to be illuminated. The total wattage will be provided for input into the simulation software.

#### Infiltration&Ventilation

Although developed initially for eQUEST users, the approach can be used for other simulation software if needed. The approach allows for infiltration and exhaust in apartments to be combined in the worksheet and a combined value to be entered into the software.

#### EIR for PTAC or PTHP

Although developed initially for eQUEST users, the approach can be used for other simulation software if the energy efficiency of these systems are entered in terms of EIR, rather than EER.

#### Results from eQUEST

For eQUEST users only, this worksheet is based upon the Parns.csv file that is generated upon simulation of your building. If those results are pasted into this worksheet, according to the directions, the performance rating will automatically calculate in the Simulation Summary worksheet.

#### Simulation Summary

This worksheet requires you to enter the fuel prices in order to calculate the overall energy cost savings, which are required to demonstrate achievement of the Performance Target. This tab links to the Results eQUEST tab and is based on natural gas or electric heat. To use oil, modifications to this tab would be needed.

|   |   |                        |                     |                        |
|---|---|------------------------|---------------------|------------------------|
|   | <b>Instructions:</b>  |                        |                     |                        |
| 1 | First fill in the Interior Lighting tab (this information will populate the square footages for this table) |                        |                     |                        |
| 2 | Only fill in cells highlighted with this color.   |                        |                     |                        |
|   | <b>Basic Project Information</b>  |                        |                     |                        |
|   | Number of Units (per building)  |                        |                     |                        |
|   | Studio  |                        |                     |                        |
|   | 1 - Bedroom   |                        |                     |                        |
|   | 2 - Bedroom   |                        |                     |                        |
|   | 3 - Bedroom   |                        |                     |                        |
|   | 4 - Bedroom   |                        |                     |                        |
|   | Building Areas (per building)   |                        |                     |                        |
|   | <b>Building Area</b>  | <b>Total Square Ft</b> | <b>Conditioned?</b> | <b>Lighting (W/sf)</b> |
|   | Apartment   |                        |                     | #DIV/0!                |
|   | Storage, active   | 0                      |                     | #DIV/0!                |
|   | Storage, inactive   | 0                      |                     | #DIV/0!                |
|   | Lobby   | 0                      |                     | #DIV/0!                |
|   | Corridor/Transition   | 0                      |                     | #DIV/0!                |
|   | Stairs - Active   | 0                      |                     | #DIV/0!                |
|   | Restroom  | 0                      |                     | #DIV/0!                |
|   | Office  | 0                      |                     | #DIV/0!                |
|   | Conference/meeting/multipurpose   | 0                      |                     | #DIV/0!                |
|   | Electrical/Mechanical   | 0                      |                     | #DIV/0!                |
|   | Workshop  | 0                      |                     | #DIV/0!                |
|   | Parking garage  | 0                      | Unconditioned       | #DIV/0!                |
|   | Nonresidential Spaces (ie. commercial)  |                        |                     |                        |
|   |   | <b>0</b>               |                     |                        |
|   | Type of Garage  |                        |                     |                        |

**ENERGY STAR Multifamily High Rise  
Reporting Summary, Version 1.2**

**Table 1. General Project Information**

|   |  |                      |  |
|---|--|----------------------|--|
| Current Project Status:                         |  | Builder / Developer: |  |
| Estimated Construction Completion Date (mo/yr): |  | Name of contact:     |  |
| Project Name:                                   |  | Phone:               |  |
| Project Address:                                |  | E-mail:              |  |
| Project City, State, Zip:                       |  |                      |  |

**Table 2. Modeling Information**

|          |  |                                   |  |
|----------|--|-----------------------------------|--|
| Modeler: |  | Simulation Program & Version #:   |  |
| Company: |  | Baseline:                         |  |
| Phone:   |  | Weather File Location (City, ST): |  |
| E-mail:  |  | Climate Zone:                     |  |

**Table 3. Building Information**

|                         |        |                               |      |      |      |         |
|-------------------------|--------|-------------------------------|------|------|------|---------|
| # of stories:           |        | Total bldg ft <sup>2</sup> :  |      | 0    |      |         |
| Space heating fuel:     |        | Residential:                  |      | 0    |      |         |
| DHW fuel:               |        | Common space:                 |      | 0    |      |         |
| Heating system:         |        | Commercial:                   |      | 0    |      |         |
| Cooling system:         |        | Other:                        |      | 0    |      |         |
| Ventilation system:     |        | Conditioned ft <sup>2</sup> : |      | 0    |      |         |
| DHW System:             |        | Heated & cooled:              |      | 0    |      |         |
|                         |        | Heated-only:                  |      | 0    |      |         |
|                         |        | Cooled-only:                  |      | 0    |      |         |
| Apartment type          | Studio | 1-BR                          | 2-BR | 3-BR | 4-BR | Total   |
| # of apartments         | 0      | 0                             | 0    | 0    | 0    | 0       |
| Average ft <sup>2</sup> | NA     | NA                            | NA   | NA   | NA   | #DIV/0! |

**Table 4. ENERGY STAR Portfolio Manager Input**

|  |         |       |  |
|--|---------|-------|--|
| Gross Floor Area                       | 0       | Notes |  |
| Number of bedrooms                     | 0       |       |  |
| Number of Floors                       | 0       |       |  |
| Number of in-apartment laundry hookups | 0       |       |  |
| Number of common area laundry hookups  | 0       |       |  |
| Number of dishwashers                  | 0       |       |  |
| % gross floor area that is heated      | #DIV/0! |       |  |
| % gross floor area that is cooled      | #DIV/0! |       |  |

**Table 5. Comparison of Inputs**

| Model Input Parameter                       | Example Unit        | Baseline Design<br>(provide description and specification) | Proposed Final Design<br>(provide description and specification) |
|---|---------------------|--|--|
| <b>Building envelope</b>                    |                     |  |  |
| Ext. wall construction (above grade)        | U-factor or R       |  |  |
| Ext. wall construction (below grade)        | C-factor or R       |  |  |
| Floor construction                          | U-factor or R       |  |  |
| Slab-on-grade construction (unheated)       | F-factor            |  |  |
| Slab-on-grade construction (embedded heat)  | F-factor            |  |  |
| Slab-below grade construction               | C-factor            |  |  |
| Roof construction                           | U-factor or R       |  |  |
| Window/wall area ratio                      | %                   |  |  |
| Window type and U-factor                    | U-factor            |  |  |
| Window SHGC                                 | SHGC                |  |  |
| Shading devices                             |                     |  |  |
| Doors                                       | U-factor            |  |  |
| <b>Lighting &amp; appliances</b>            |                     |  |  |
| In-unit lighting power density              | W/ft <sup>2</sup>   | 1.1 WSF  | #DIV/0! WSF  |
| Corridor lighting power density             | W/ft <sup>2</sup>   | 0.5 WSF  | #DIV/0! WSF  |
| Other interior lighting                     | W/ft <sup>2</sup>   | #DIV/0! WSF, per ASHRAE 90.1, Table                        | #DIV/0! WSF  |
| Exterior lighting                           | W                   | 0  | 0  |
| Lighting controls                           |                     |  |  |
| Refrigerator                                | ENERGY STAR?        |  |  |
| Dishwasher                                  | ENERGY STAR?        |  |  |
| Clothes Washer                              | ENERGY STAR?        |  |  |
| <b>HVAC System</b>                          |                     |  |  |
| Primary HVAC system type                    |                     |  |  |
| Apartment Ventilation System                |                     |  |  |
| Corridor Outdoor Air Supply                 | CFM/ft <sup>2</sup> |  |  |
| Primary System Heating efficiency           | AFLUE / HSPF        |  |  |
| Primary System Cooling efficiency           | SEER / EER          |  |  |
| Fan supply power                            | kW                  |  |  |
| <b>Domestic Hot Water System</b>            |                     |  |  |
| Equipment efficiency                        | EF, %E1             |  |  |
| Kitchen Faucets                             | GPM                 | 2.5 @ 80 psi   | 0.00   |
| Lavatory Faucets                            | GPM                 | 2.5 @ 80 psi   | 0.00   |
| Showerheads                                 | GPM                 | 2.5 @ 80psi  | 0.00   |
| Solar DHW system                            | % of load           |  |  |
| <b>Renewable Electric Generation System</b> |                     |  |  |
| Type of system                              |                     |  |  |
| Rated capacity                              | kW                  |  |  |
| Other                                       |                     |  |  |

**Table 6. Comparison of Estimated Consumption**

| End Use               | Units | Baseline<br>Annual Consumption | Proposed Design<br>Annual Consumption | % Savings<br>by end-use | % Savings<br>toward Target |
|-----------------------|-------|--------------------------------|---------------------------------------|-------------------------|----------------------------|
| <b>Electric loads</b> |       |                                |                                       |                         |                            |
| Ventilation fans      | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Space heating         | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Space cooling         | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Domestic hot water    | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Interior lighting     | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Exterior lighting     | kWh   | 0                              | 0                                     | NA                      | #DIV/0!                    |
| Appliances            | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Pumps and Aux         | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Other exterior        | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Plug loads            | kWh   | 0                              | 0                                     | NA                      | #DIV/0!                    |
| <b>Gas loads</b>      |       |                                |                                       |                         |                            |
| Space heating         | MMBtu | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Domestic hot water    | MMBtu | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Appliances            | MMBtu | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Other                 | MMBtu | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| <b>Fuel oil loads</b> |       |                                |                                       |                         |                            |
| Space heating         | MMBtu | #DIV/0!                        | 0                                     | NA                      | #DIV/0!                    |
| Domestic hot water    | MMBtu | #DIV/0!                        | 0                                     | NA                      | #DIV/0!                    |
| Other                 | MMBtu | #DIV/0!                        | 0                                     | NA                      | #DIV/0!                    |
| <b>Totals</b>         |       |                                |                                       |                         |                            |
| Electric loads        | kWh   | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Gas loads             | MMBtu | #DIV/0!                        | 0                                     | #DIV/0!                 | #DIV/0!                    |
| Oil loads             | MMBtu | 0                              | 0                                     | NA                      | #DIV/0!                    |

**Table 7. Fuel Cost**

|             |      |           |
|-------------|------|-----------|
| Electricity | 0    | \$/kWh    |
| Natural Gas | 0.00 | \$/Therm  |
| Fuel Oil    | 0.00 | \$/Gallon |

**Table 8. Performance Rating Calculation**

|                                | Baseline         |                  |          | Proposed         |                  |          | Savings<br>% | \$ Savings, %  |
|--------------------------------|------------------|------------------|----------|------------------|------------------|----------|--------------|----------------|
|                                | Fossil Fuel, Btu | Electricity, Btu | Cost, \$ | Fossil Fuel, Btu | Electricity, Btu | Cost, \$ |              |                |
| Annual Heating                 | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| Annual Cooling                 | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| Annual Lighting                | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| Annual Hot Water               | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| Annual Appliance               | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| Annual Other                   | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | #DIV/0!        |
| <b>Total without Renewable</b> | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | <b>#DIV/0!</b> |
| Annual Renewable               | 0                | 0                | 0        | 0                | 0                | 0        | 0%           | 0%             |
| <b>Total with Renewable</b>    | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | 0        | #DIV/0!      | <b>#DIV/0!</b> |

**Table 9. Energy Usage per Square Foot of Conditioned Area**

|                                | Baseline<br>Btu/SqFt | Proposed<br>Btu/SqFt |
|--------------------------------|----------------------|----------------------|
| Annual Heating                 | 0                    | 0                    |
| Annual Cooling                 | 0                    | 0                    |
| Annual Lighting                | 0                    | 0                    |
| Annual Hot Water               | 0                    | 0                    |
| Annual Appliance               | 0                    | 0                    |
| Annual Other                   | 0                    | 0                    |
| <b>Total without Renewable</b> | 0                    | 0                    |



**Instructions:**

- 1 Using ASHRAE 90.1-2007 Table 5.5 (copied below), enter values for your Climate Zone and framing in the Baseline column.
- 2 Baseline fenestration is based on construction. Wood-frame buildings use nonmetal framing; all others use applicable metal framing.
- 3 Enter actual NFRC values in the Proposed column.
- 4 Use calculated values as inputs into eQUEST Glass Type Properties - Basic Specifications screen.

Climate Zone

Construction Type

**ASHRAE 90.1-2007**

|                | Residential |          | Nonresidential |          |
|----------------|-------------|----------|----------------|----------|
|                | Baseline    | Proposed | Baseline       | Proposed |
| NFRC SHGC      |             |          |                |          |
| NFRC U-value   |             |          |                |          |
| eQUEST SC      | 0.000       | 0.000    | 0.000          | 0.000    |
| eQUEST U-value | #DIV/0!     | #DIV/0!  | #DIV/0!        | #DIV/0!  |

| Residential                   | Climate Zone 1 |      | Climate Zone 2 |      | Climate Zone 3 |      | Climate Zone 4 |      | Climate Zone 5 |      | Climate Zone 6 |      | Climate Zone 7 |      | Climate Zone 8 |      |
|-------------------------------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|
|                               | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC |
| Nonmetal Framing (all)        | 1.20           | 0.25 | 0.75           | 0.25 | 0.65           | 0.25 | 0.40           | 0.40 | 0.35           | 0.40 | 0.35           | 0.40 | 0.35           | NR   | 0.35           | NR   |
| Metal Framing (storefront)    | 1.20           | 0.25 | 0.70           | 0.25 | 0.60           | 0.25 | 0.50           | 0.40 | 0.45           | 0.40 | 0.45           | 0.40 | 0.40           | NR   | 0.40           | NR   |
| Metal Framing (entrance door) | 1.20           | 0.25 | 1.10           | 0.25 | 0.90           | 0.25 | 0.85           | 0.40 | 0.80           | 0.40 | 0.80           | 0.40 | 0.80           | NR   | 0.80           | NR   |
| Metal Framing (all other)     | 1.20           | 0.25 | 0.75           | 0.25 | 0.65           | 0.25 | 0.55           | 0.40 | 0.55           | 0.40 | 0.55           | 0.40 | 0.45           | NR   | 0.45           | NR   |
| <b>Nonresidential</b>         | Climate Zone 1 |      | Climate Zone 2 |      | Climate Zone 3 |      | Climate Zone 4 |      | Climate Zone 5 |      | Climate Zone 6 |      | Climate Zone 7 |      | Climate Zone 8 |      |
|                               | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC | U-value        | SHGC |
| Nonmetal Framing (all)        | 1.20           | 0.25 | 0.75           | 0.25 | 0.65           | 0.25 | 0.40           | 0.40 | 0.35           | 0.40 | 0.35           | 0.40 | 0.35           | 0.45 | 0.35           | 0.45 |
| Metal Framing (storefront)    | 1.20           | 0.25 | 0.70           | 0.25 | 0.60           | 0.25 | 0.50           | 0.40 | 0.45           | 0.40 | 0.45           | 0.40 | 0.40           | 0.45 | 0.40           | 0.45 |
| Metal Framing (entrance door) | 1.20           | 0.25 | 1.10           | 0.25 | 0.90           | 0.25 | 0.85           | 0.40 | 0.80           | 0.40 | 0.80           | 0.40 | 0.80           | 0.45 | 0.80           | 0.45 |
| Metal Framing (all other)     | 1.20           | 0.25 | 0.75           | 0.25 | 0.65           | 0.25 | 0.55           | 0.40 | 0.55           | 0.40 | 0.55           | 0.40 | 0.45           | 0.45 | 0.45           | 0.45 |

**Instructions:**

- 1 First, fill in Basic Info tab.
- 2 In the "Baseline Fixture" table, enter an estimated number of uses/day for urinals in the appropriate space. Enter "0" if there are no urinals in building.
- 3 The baseline usage values will generate automatically.
- 4 In the "Proposed Fixture" table, enter the flow rate for each proposed fixture type.
- 5 When on-site collected graywater or rainwater is used for sewage conveyance, the total estimated annual graywater quantity may be subtracted from the total annual design case water usage. Estimated graywater quantity may not be greater than the total usage of fixtures that utilize it. For example, if graywater will be used only in flush toilets, the estimated graywater quantity cannot be greater than the total annual water used by the toilets. Estimate graywater usage for each fixture type and enter the value in the appropriate cell.
- 6 The remaining values will generate automatically. Water usage savings and cost savings may be reported as indicated in the Water Savings section of the Simulation Guidelines.

|                                   |   |
|-----------------------------------|---|
| Average Price per Gallon of Water |   |
| No. of Occupants                  | 0 |
| Dishwasher Savings (Gal/yr)       | 0 |
| Clothes Washers Savings (Gal/yr)  | 0 |

| Baseline Fixture |                                 | Baseline Flow Rates (GPF/GPM) | Baseline Usage (Gallons/year) |
|------------------|---------------------------------|-------------------------------|-------------------------------|
| Toilets          | <Enter "0" below if no urinals> | 1.6                           | 0                             |
| Urinals          |                                 | 1.0                           | 0                             |
| Showerheads      |                                 | 2.5                           | 0                             |
| Bathroom Faucets |                                 | 2.5                           | 0                             |
| Kitchen Faucets  |                                 | 2.5                           | 0                             |
| <b>Total</b>     |                                 |                               | <b>0</b>                      |

| Proposed Fixture           | Proposed Fixture Flow Rate (GPM/GPF) | Graywater Usage (Gallons/year) | Proposed Usage (Gallons/year) |
|----------------------------|--------------------------------------|--------------------------------|-------------------------------|
| Toilets                    |                                      |                                | 0                             |
| Urinals                    |                                      |                                | 0                             |
| Showerheads (@80 psi)      |                                      |                                | 0                             |
| Bathroom Faucets (@80 psi) |                                      |                                | 0                             |
| Kitchen Faucets (@80 psi)  |                                      |                                | 0                             |
| <b>Total</b>               |                                      |                                | <b>0</b>                      |

| Savings by Fixture Type | Water Usage Savings (Gallons/year) | Cost Savings (\$/year) |
|-------------------------|------------------------------------|------------------------|
| Toilets                 | 0                                  | \$0.00                 |
| Urinals                 | 0                                  | \$0.00                 |
| Showerheads             | 0                                  | \$0.00                 |
| Bathroom Faucets        | 0                                  | \$0.00                 |
| Kitchen Faucets         | 0                                  | \$0.00                 |
| <b>Total</b>            | <b>0</b>                           | <b>\$0.00</b>          |

**Instructions:**

- 1 First fill in the Basic Info and Water Savings tabs.
- 2 Fill in cells highlighted with this color.
- 3 Data to be entered into software.

|                                | Proposed | Baseline |
|--------------------------------|----------|----------|
| Avg Faucet gpm (@ 80 psi)      | #DIV/0!  | 2.5      |
| Showerhead gpm (@ 80 psi)      | 0.0      | 2.5      |
| Total Gal/day (occupant only)  | #DIV/0!  | 0        |
| Total Gal/day (w/both DW & CW) | #DIV/0!  | -        |
| GPM w/DOE APT DHW schedule     | #DIV/0!  | -        |

| Schedule | DOE APT DHW | Proposed | Baseline |
|----------|-------------|----------|----------|
| 0.05     | 0           | #DIV/0!  | -        |
| 0.05     | 1           | #DIV/0!  | -        |
| 0.05     | 2           | #DIV/0!  | -        |
| 0.05     | 3           | #DIV/0!  | -        |
| 0.05     | 4           | #DIV/0!  | -        |
| 0.05     | 5           | #DIV/0!  | -        |
| 0.3      | 6           | #DIV/0!  | -        |
| 0.5      | 7           | #DIV/0!  | -        |
| 0.4      | 8           | #DIV/0!  | -        |
| 0.3      | 9           | #DIV/0!  | -        |
| 0.3      | 10          | #DIV/0!  | -        |
| 0.35     | 11          | #DIV/0!  | -        |
| 0.4      | 12          | #DIV/0!  | -        |
| 0.35     | 13          | #DIV/0!  | -        |
| 0.35     | 14          | #DIV/0!  | -        |
| 0.3      | 15          | #DIV/0!  | -        |
| 0.3      | 16          | #DIV/0!  | -        |
| 0.5      | 17          | #DIV/0!  | -        |
| 0.5      | 18          | #DIV/0!  | -        |
| 0.4      | 19          | #DIV/0!  | -        |
| 0.35     | 20          | #DIV/0!  | -        |
| 0.45     | 21          | #DIV/0!  | -        |
| 0.3      | 22          | #DIV/0!  | -        |
| 0.05     | 23          | #DIV/0!  | -        |
| 6.7      |             | #DIV/0!  | -        |

Occupancy  Low/medium/high usage (see Simulation Guidelines, 3.9.2)  
44 gallons per person per day

Kitchen Faucet  GPM  
 Bath Faucet  GPM  
 Baseline DW  GAL/YR PER APT =  gallons/day-apt (1 dishwasher)  
 Proposed DW  GAL/YR PER APT =  gallons/day-apt (1 dishwasher)  
 Baseline CW  hot water gallons/yr =  Total hot water gallons/day (all clothes washers)  
 Proposed CW  hot water gallons/yr =  Total hot water gallons/day (all clothes washers)

Do apartments have dishwashers? (Y/N)  
 Are they Energy Star rated? (Y/N/NA)  
 # of bedrooms  
 # of apartments  
 # kitchen faucets  # kitchens  
 # lav faucets  # lavatories (that require exhaust)  
 # of dishwashers  
 # of clothes washers  
 Are they Energy Star rated? (Y/N/NA)  
 washer and dryer

**Central DHW**  
 DHW Storage Volume (gallons)  radius  
 DHW Storage Volume (cubic feet)  height  
 R-value  
 Surface Area  % EFF  HIR/EIR  
 UA for eQuest  #DIV/0!

**In-Unit Water Heater**  
 Volume  Fuel  EF  HIR/EIR  
 Baseline  #DIV/0! #VALUE!  
 Proposed    #DIV/0!

**Instructions:**

- 1 First, fill out Basic Info and DHW Demand tabs.
- 2 Fill in cells highlighted with this color.
- 3 Data to be entered in eQUEST as Equipment or Internal Energy Sources.

|  | <b>Proposed</b>   |
|--|---|
| Refrigerator, kWh/yr-unit                      | 423   |
| Refrigerator, kWh/yr-bldg                      | 0   |
| <b>Refrigerator, W/SqFt</b>                    | <b>#DIV/0!</b>  |
| Electric Stove, kWh/yr-unit                    | 0   |
| Electric Stove, kWh/yr-bldg                    | 0   |
| <b>Stove, W/SqFt</b>                           | <b>#DIV/0!</b>  |
| Dishwasher, kWh/yr-unit                        | 0   |
| Dishwasher, kWh/yr-bldg                        | 0   |
| <b>Dishwasher, W/SqFt</b>                      | <b>#DIV/0!</b>  |
| In-Unit Clothes Washer, kWh/yr                 | 0   |
| In-Unit Clothes Washer, kWh/yr-bldg            | 0   |
| <b>In-Unit Washer, W/SqFt</b>                  | <b>#DIV/0!</b>  |
| In-Unit Dryer, kWh/yr-bldg                     | <b>#DIV/0!</b>  |
| <b>In-Unit Dryer, W/SqFt</b>                   | <b>#DIV/0!</b>  |
| Common Washer, kWh/yr-machine                  | 0   |
| Common Washer, kWh/yr-bldg                     | 0   |
| <b>Common Washer, W/SqFt</b>                   | <b>#DIV/0!</b>  |
| Common Dryer, kWh/yr-bldg                      | <b>#DIV/0!</b>  |
| <b>Common Dryer, W/SqFt</b>                    | <b>#DIV/0!</b>  |
| <b>In-Unit Dryer, BTU/h (PER dryer)</b>        | <b>-</b>  |
| In-unit, misc. kWh/yr-SqFt (SG 2-11)           | 1.05  |
| <b>In-unit misc W/SqFt</b>                     | <b>0.50</b>   |
| <b>Corridor, restrooms &amp; Stairs W/SqFt</b> | <b>0.2</b>  |
| <b>Elevator W/SqFt</b>                         | <b>#DIV/0!</b>  |
| <b>Office W/SqFt</b>                           | <b>1.5</b>  |
| <b>Other Public and Common Area W/SqFt</b>     | <b>0.5</b>  |
| <b>Hour</b>                                    | <b>Common area plug load schedule, SG 2.11 (Same as T24 EQP WD)</b> |
| 1  | 0.1   |
| 2  | 0.1   |
| 3  | 0.1   |
| 4  | 0.1   |
| 5  | 0.1   |
| 6  | 0.3   |
| 7  | 0.45  |
| 8  | 0.45  |
| 9  | 0.45  |
| 10   | 0.45  |
| 11   | 0.3   |

|       |    |     |
|-------|----|-----|
|       | 12 | 0.3 |
|       | 13 | 0.3 |
|       | 14 | 0.3 |
|       | 15 | 0.3 |
|       | 16 | 0.3 |
|       | 17 | 0.3 |
|       | 18 | 0.3 |
|       | 19 | 0.6 |
|       | 20 | 0.8 |
|       | 21 | 0.9 |
|       | 22 | 0.8 |
|       | 23 | 0.6 |
|       | 24 | 0.3 |
| Total |    | 9   |

| Baseline   | Equipment # (optional)    | Sensible Heat Ratio | Latent Heat Ratio |
|--|---------------------------|---------------------|-------------------|
| 529  |                           |                     |                   |
| 0  |                           |                     |                   |
| #DIV/0!  | Apt Equipment [#]         | 1.0                 | 0.0               |
| 0  |                           |                     |                   |
| 0  |                           |                     |                   |
| #DIV/0!  | Apt Equipment [#]         | 0.0                 | 0.0               |
| 0  |                           |                     |                   |
| 0  |                           |                     |                   |
| #DIV/0!  | Apt Equipment [#]         | 0.60                | 0.15              |
| 0  |                           |                     |                   |
| 0  |                           |                     |                   |
| #DIV/0!  | Apt Equipment [#]         | 0.8                 | 0.0               |
| #DIV/0!  |                           |                     |                   |
| #DIV/0!  | Apt Equipment [#]         | 0.15                | 0.05              |
| 0  |                           |                     |                   |
| 0  |                           |                     |                   |
| #DIV/0!  | NA                        | NA                  | NA                |
| #DIV/0!  |                           |                     |                   |
| #DIV/0!  | NA                        | 0.15                | 0.05              |
| -  | NA                        | NA                  | NA                |
| 1.05   |                           |                     |                   |
| 0.50   | Apt Equipment 1           | 0.9                 | 0.1               |
| 0.2  | Corr & Stairs Equipment 1 | 1.0                 | 0.0               |
| #VALUE!  | Elevator Equipment 1      | 0.1                 | 0.0               |
| 1.5  | Office Equipment 1        | 1.0                 | 0.0               |
| 0.5  | Common Area Equipment 1   |                     |                   |
| <b>Apartment Plug load schedule (Same as T24 DAY EQP WD)</b> |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.05   |                           |                     |                   |
| 0.5  |                           |                     |                   |
| 0.5  |                           |                     |                   |
| 0.5  |                           |                     |                   |



|                 |                                      |   |  |
|-----------------|--------------------------------------|---|--|
| <b>Schedule</b> |                                      |   |  |
|                 |                                      |   |  |
| T24 DAY EQP WD  |                                      |   | 1 Stove  |
|                 | <input type="text"/>                 | Stove Type                              | 0.0 Therms   |
|                 |                                      |   |  |
| T24 DAY EQP WD  |                                      |   |  |
|                 | <input type="text" value="0"/>       | # of dishwashers                        |  |
|                 |                                      |   |  |
| T24 DAY EQP WD  |                                      |   |  |
|                 | <input type="text" value="1"/>       | F-factor                                |  |
| T24 DAY EQP WD  | <input type="text" value="0"/>       | # of washers                            |  |
|                 | <input type="text"/>                 | # of dryers                             | 1 Dryer  |
| T24 DAY EQP WD  | <input type="text"/>                 | DRYER                                   | 0.0 Therms   |
|                 | <input type="text" value="#DIV/0!"/> | Average # bedrooms in living units      |  |
|                 | <input type="text"/>                 | sum of area of all common laundry rooms |  |
| T24 EQP WD      |                                      |   |  |
|                 |                                      |   |  |
| T24 EQP WD      |                                      |   |  |
| T24 DAY EQP WD  |                                      |   |  |
|                 |                                      |   |  |
| T24 DAY EQP WD  | Number of Stories:                   | <input type="text" value="0"/>          |  |
| T24 EQP WD      | Area of Elevator:                    | <input type="text"/>                    |  |
| T24 EQP WD      | Elevator Type:                       |   |  |
| T24 EQP WD      | SG, Section 3.11                     |   | Baseline kWh/yr for elevator                                 |
|                 | <input type="text"/>                 |   | Proposed kWh/yr (same as Baseline if not requesting perform: |

ance credit)

**Instructions:**

- 1 Use this worksheet to generate schedules for lighting inputs.
- 2 Enter hours/day in the cell highlighted in this color to generate a 24 hour schedule in column
- 3 Do not edit cells highlighted in this color.
- 4 Do not edit cells highlighted in this color. These calculated values are for editing or creating
- 5 Elevator lighting should only be assigned to ONE elevator zone.
- 6 In eQUEST, exit Signs can be added as Lighting #2 (kW) in the appropriate zones.
- 7 Credit for occupancy sensors can be applied to corridors and stairs by reducing proposed V

| Daily operating hours               | hr/day |
|-------------------------------------|--------|
| Apartments and Balconies            | 2.34   |
| Garage, Corridors, Lobbies & Stairs | 24     |
| Exterior Lighting                   | 12     |
| Non Apartment, Non 24 hour          |        |

| Hr                         | APT LTG WD      |  | Adjusted Fraction |
|----------------------------|-----------------|--|-------------------|
|                            | Fraction        |  | Apartments        |
| 1                          | 0.05            |  | 0.015             |
| 2                          | 0.05            |  | 0.015             |
| 3                          | 0.05            |  | 0.015             |
| 4                          | 0.05            |  | 0.015             |
| 5                          | 0.05            |  | 0.015             |
| 6                          | 0.05            |  | 0.015             |
| 7                          | 0.25            |  | 0.077             |
| 8                          | 0.45            |  | 0.139             |
| 9                          | 0.45            |  | 0.139             |
| 10                         | 0.35            |  | 0.108             |
| 11                         | 0.35            |  | 0.108             |
| 12                         | 0.35            |  | 0.108             |
| 13                         | 0.25            |  | 0.077             |
| 14                         | 0.25            |  | 0.077             |
| 15                         | 0.25            |  | 0.077             |
| 16                         | 0.25            |  | 0.077             |
| 17                         | 0.25            |  | 0.077             |
| 18                         | 0.35            |  | 0.108             |
| 19                         | 0.7             |  | 0.217             |
| 20                         | 0.7             |  | 0.217             |
| 21                         | 0.7             |  | 0.217             |
| 22                         | 0.7             |  | 0.217             |
| 23                         | 0.6             |  | 0.186             |
| 24                         | 0.05            |  | 0.015             |
| Total                      | 7.55            |  | 2.34              |
| Apartment Adjustment       | 0.3099337748344 |  |                   |
| Non Apartment, Non 24 hour |                 |  | 0                 |





|  |  |  |  |   |   |  |     |
|--|--|--|--|---|---|--|-----|
|  |  |  |  | 0 | 0 |  | 0.0 |
|  |  |  |  | 0 | 0 |  | 0.0 |

| <b>Summary</b>                                   |         |
|--|---------|
| Total in-unit area with specified lighting, SqFt | 0.0     |
| Total specified lighting, W                      | 0.0     |
| Specified lighting power density, W/SqFt         | NA      |
| Proposed lighting power density, W/SqFt          | #DIV/0! |
| Baseline lighting power density, W/SqFt          | 1.10    |



|     |     |
|-----|-----|
| 0.0 | 0.0 |
| 0.0 | 0.0 |











































**Instructions:**

- 1 Enter data in the cells highlighted with this color.
- 2 Use values from the cells highlighted in this color in the energy simulations.
- 3 In eQUEST, exterior lighting should be entered in the "Utility & Economics" section, un
- 4 For proposed design simulation, enter exterior lighting specified on drawings.
- 5 Apartment balcony lighting should be treated as façade lighting, and modeled using the **Exterior Lighting Allowances (Per Table 9.4.5 of ASHRAE 90.1-2007)**

| <i>Area Type</i>                  | <i>Lighting Power Density</i> | <i>Area</i> | <i>Baseline Lighting Allowance</i> | <i>Proposed Lighting Allowance</i> |
|-----------------------------------|-------------------------------|-------------|------------------------------------|------------------------------------|
|                                   | <i>W/SqFt</i>                 | <i>SqFt</i> | <i>W</i>                           | <i>W</i>                           |
| Uncovered parking lots and drives | 0.15                          |             | 0                                  |                                    |
| Walkways 10ft wide or greater     | 0.20                          |             | 0                                  |                                    |
| Exterior stairways                | 1.00                          |             | 0                                  |                                    |
| Canopies and overhangs            | 1.25                          |             | 0                                  |                                    |
| Building Facades (1)              | 0.20                          |             | 0                                  |                                    |

| <i>Area Type</i>              | <i>Lighting Power Density,</i> | <i>Linear feet</i> | <i>Baseline Lighting Allowance</i> | <i>Proposed Lighting Allowance</i> |
|-------------------------------|--------------------------------|--------------------|------------------------------------|------------------------------------|
|                               | <i>W/linear foot</i>           | <i>Ft</i>          | <i>W</i>                           | <i>W</i>                           |
| Walkways less than 10 ft wide | 1.00                           |                    | 0                                  |                                    |
| Main building entrance (2)    | 30.00                          |                    | 0                                  |                                    |
| Other exterior doors (2)      | 20.00                          |                    | 0                                  |                                    |
| Building Facades (3)          | 5.00                           |                    | 0                                  |                                    |

**Total Exterior Building Allowance to be entered in Energy Models (4)**

|                     | Baseline | Proposed |       |
|---------------------|----------|----------|-------|
| <i>Tradable</i>     | 0        | 0        | Watts |
| <i>Non-Tradable</i> | 0        | 0        | Watts |
|                     | 0        | 0        | Watts |

**Notes:**

- (1) Enter area of all illuminated walls or surfaces in the Area column
- (2) Enter total linear foot of door width for main entrance doors
- (3) Enter total linear foot of all illuminated wall or surface length
- (4) Total values include additional 5% allowance per Section 9.4.5

der Electric Meter as a Direct Exterior Load, with Ambient Lighting enduse and a 12 hr/day schedule.

≈ 2.34 hr/day schedule for in-unit lighting.

**Proposed Fixture Description**

|  |
|--|
|  |
|  |
|  |
|  |

If Proposed façade lighting exceeds Baseli  
If Proposed façade lighting is less than Bas

**Proposed Fixture Description**

|  |
|--|
|  |
|  |
|  |

ne allowance, model proposed as designed.  
seline allowance, model baseline the same as proposed.

**Instructions:**

- 1 In the simulation software, rather than model Outside Air and Exhaust for Apartments separately, you may combine and model as "Infiltration".
- 2 You may model Exhaust for refuse rooms and laundry rooms as equivalent "Infiltration" as well.
- 3 Fill in cells highlighted with this color.
- 4 Data to be entered into simulation software.
- 5 Corridor Supply Air can be modeled as Outside Air in software.
- 6 Supply Ventilation for Apartments should be mechanical supply or trickle vents, but not corridor make-up air.
- 7 ACH or CFM/SF can be used for data entry.
- 8 In eQUEST, electricity for exhaust fans should be modeled as Direct-Interior or Exterior Loads in Electric Meter, with Ventilation Fans entered as a load.
- 9 Red cells will indicate when continuous baseline ventilation is not properly modeled.

|  | Baseline          | Proposed          | Baseline          |
|--|-------------------|-------------------|-------------------|
| Space Type   | Apartments        |                   | Refuse            |
| Total Area For Space Type, SqFt                                | 0                 |                   |                   |
| Ceiling Height, Ft   |                   |                   |                   |
| Total Volume For Space Type, CuFt                              | 0                 |                   |                   |
| Exhaust Ventilation, CFM (Design/tested flows at grilles)      |                   |                   |                   |
| Ventilation Duct Leakage (Baseline add 10 CFM/floor per shaft) |                   |                   |                   |
| Exhaust Runtime, hr/day  |                   |                   |                   |
| Assumed Infiltration Rate, ACH                                 | 0.1               | 0.1               | 0.1               |
| Equivalent Continuous Exhaust, ACH                             | #DIV/0!           | #DIV/0!           | #DIV/0!           |
| Supply Ventilation, CFM  |                   |                   |                   |
| Supply Runtime, hr/day   |                   |                   |                   |
| Equivalent Continuous Supply, ACH                              | #DIV/0!           | #DIV/0!           | #DIV/0!           |
| Minimum Outdoor Air Requirements, ACH                          | 0.35              | 0.35              |                   |
| Average Combined Hourly Infiltration/Ventilation Rate, ACH     | #DIV/0!           | #DIV/0!           | #DIV/0!           |
| Average Combined Hourly Infiltration/Ventilation Rate, CFM/SF  | #DIV/0!           | #DIV/0!           | #DIV/0!           |
| <b>Exhaust Fan Data</b>  |                   |                   |                   |
| Exhaust Fan Type   |                   | 0                 |                   |
| CFM/W  | #N/A              |                   | #N/A              |
| Pfan (Watts)   | #N/A              | #DIV/0!           | #N/A              |
| HP   | Do not Enter data | Do not Enter data | Do not Enter data |
| Pfan (Watts)   | NA                | NA                | NA                |
| BHP  | Do not Enter data | Do not Enter data | Do not Enter data |
| Motor Efficiency   | Do not Enter data | Do not Enter data | Do not Enter data |
| Pfan (Watts)   | NA                | NA                | NA                |

|  |         |          |   |
|--|---------|----------|---|
| <b>Local Exhaust (62.2-2007):</b>            | Kitchen | Bathroom | 0 |
| MAXIMUM CONTINUOUS LOCAL BASELINE EXHAUST:   | 0       | 30       |   |
| MAXIMUM INTERMITTENT LOCAL BASELINE EXHAUST: | 150     | 75       |   |

|  |         |          |   |
|--|---------|----------|---|
|  | Kitchen | Bathroom | 0 |
| MINIMUM CONTINUOUS LOCAL BASELINE EXHAUST:   | 0       | 20       |   |
| MINIMUM INTERMITTENT LOCAL BASELINE EXHAUST: | 100     | 50       |   |

|                                     |  |  |
|-------------------------------------|--|--|
| BASELINE LOCAL EXHAUST VENTILATION: |  |  |
| PROPOSED LOCAL EXHAUST VENTILATION: |  |  |
| INTERMITTENT OR CONTINUOUS?:        |  |  |

Insufficient Ventilation Insufficient Ventilation

|  |   |
|--|---|
| Kitchen Area:                                  |   |
| Kitchen Ceiling height:                        |   |
| Continuous CFM equivalent to 5ACH (62.2-2007): | 0 |

---

|   |         |     |     |
|---|---------|-----|-----|
| <b>Whole Unit Ventilation Rate (62.2-2007):</b> | Studios | 1BR | 2BR |
| Average Area (SqFt):                            |         |     |     |
| Minimum CFM required:                           | 15      | 15  | 23  |
| Maximum CFM allowed in Baseline:                | 0       | 0   | 0   |
| Proposed CFM:                                   |         |     |     |

Insufficient Ventilation Insufficient Ventilation Insufficient Ventilation

---

|   |     |              |           |
|---|-----|--------------|-----------|
|   | CFM | minutes/hour | hours/day |
| <b>Convert Intermittent Ventilation to equivalent Continuous:</b> |     |              |           |

|  |                  |     |              |
|--|------------------|-----|--------------|
|  | Quantity of Fans | CFM | minutes/hour |
| <b>Combine Different Ventilation to equivalent Continuous:</b> |                  |     |              |
|  |                  |     |              |
|  |                  |     |              |
|  |                  |     |              |

ation".

duse.

| Proposed          | Baseline          | Proposed          | Baseline | Proposed |
|-------------------|-------------------|-------------------|----------|----------|
| Room              | Laundry Room      |                   |          |          |
|                   |                   |                   |          |          |
|                   |                   |                   |          |          |
|                   | 0                 |                   | 0        |          |
|                   |                   |                   |          |          |
|                   |                   |                   |          |          |
| 0.1               | 0.1               | 0.1               |          |          |
| #DIV/0!           | #DIV/0!           | #DIV/0!           | #DIV/0!  | #DIV/0!  |
|                   |                   |                   |          |          |
|                   |                   |                   |          |          |
| #DIV/0!           | #DIV/0!           | #DIV/0!           | #DIV/0!  | #DIV/0!  |
|                   |                   |                   |          |          |
| #DIV/0!           | #DIV/0!           | #DIV/0!           | #DIV/0!  | #DIV/0!  |
| #DIV/0!           | #DIV/0!           | #DIV/0!           |          |          |
|                   |                   |                   |          |          |
| 0                 |                   |                   | 0        |          |
|                   |                   | #N/A              |          |          |
| #DIV/0!           | #N/A              | #DIV/0!           |          |          |
| Do not Enter data | Do not Enter data | Do not Enter data |          |          |
| NA                | NA                | NA                |          |          |
| Do not Enter data | Do not Enter data | Do not Enter data |          |          |
| Do not Enter data | Do not Enter data | Do not Enter data |          |          |
| NA                | NA                | NA                |          |          |

CFM is the maximum allowed in the baseline if both fans run continuously or both fans run intermittently.

CFM is the minimum allowed in the baseline if both fans run continuously or both fans run intermittently.

---

| 3BR                      | 4BR                      |   |
|--------------------------|--------------------------|---|
| 30                       | 38                       | << These values are updated once you have entered your average area.    |
| 0                        | 0                        | << These values are determined once you have entered your proposed CFM. |
| Insufficient Ventilation | Insufficient Ventilation |   |

---

0 CFM is the equivalent continuous ventilation rate.

| hours/day |   |
|-----------|---|
|           | 0 |
|           | 0 |
|           | 0 |
|           | 0 |

0 CFM is the equivalent continuous ventilation rate for all fans combined.

**Instructions:**

- 1 For gas heated buildings using System 1 - PTAC, use the top chart to calculate cooling-EIR
- 2 For electric heated buildings using System 2 - PTHP, use the bottom chart to calculate cooling-EIR
- 3 Baseline PTAC fan energy should be simulated as 0.3 W/CFM
- 4 Fill in cells highlighted with this color.
- 5 Data to be entered in simulation software.

|                              | Baseline Design      |                   |                   |                      |
|------------------------------|----------------------|-------------------|-------------------|----------------------|
|                              | Common Space Systems | Apartment Systems | Apartment Systems | Common Space System1 |
| System Type                  | <b>PTAC</b>          | <b>PTAC</b>       |                   |                      |
| EER                          | 11.009               | 11.009            |                   |                      |
| Net Cooling Capacity, Btu/Hr |                      |                   |                   |                      |
| Fan BHP                      | NA                   | NA                |                   |                      |
| Fan Motor Efficiency         | NA                   | NA                |                   |                      |
| CFM                          | NA                   | NA                |                   |                      |
| Fan kW/CFM                   | 0.0003               | 0.0003            | -                 | -                    |
| EIR or 1/COP                 | 0.258                | 0.258             | #DIV/0!           | #DIV/0!              |

|                              | Baseline Design      |                   |                   |                      |
|------------------------------|----------------------|-------------------|-------------------|----------------------|
|                              | Common Space Systems | Apartment Systems | Apartment Systems | Common Space System1 |
| System Type                  | <b>PTHP</b>          | <b>PTHP</b>       |                   |                      |
| Cooling EER                  | 10.809               | 10.809            |                   |                      |
| Net Cooling Capacity, Btu/Hr |                      |                   |                   |                      |
| Fan BHP                      | NA                   | NA                |                   |                      |
| Fan Motor Efficiency         | NA                   | NA                |                   |                      |
| CFM                          | NA                   | NA                |                   |                      |
| Fan kW/CFM                   | 0.0003               | 0.0003            | -                 | -                    |
| EIR or 1/COP (COOLING)       | 0.263                | 0.263             | #DIV/0!           | #DIV/0!              |
| Net Heating Capacity, Btu/Hr |                      |                   |                   |                      |
| COP (HEATING)                | 3.018                | 3.018             |                   |                      |
| EIR or 1/COP (HEATING)       | 0.331                | 0.331             | #DIV/0!           | #DIV/0!              |

| Proposed Design      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| Common Space System2 | Common Space System3 | Common Space System4 | Common Space System5 | Common Space System6 |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
| -                    | -                    | -                    | -                    | -                    |
| #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              |

| Proposed Design      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| Common Space System2 | Common Space System3 | Common Space System4 | Common Space System5 | Common Space System6 |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
| -                    | -                    | -                    | -                    | -                    |
| #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              |
|                      |                      |                      |                      |                      |
|                      |                      |                      |                      |                      |
| #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              | #DIV/0!              |

**Instructions:**

- 1 Open Parms.csv file that corresponds to baseline and proposed eQUEST models.
- 2 Copy runs corresponding to four orientation exposures from baseline Parms.csv to row 13-16 below. If not rotated, copy into r
- 3 Copy run that corresponds to proposed design from proposed Parms.csv to row 19 below
- 4 These values will used to calculate the performance rating in the Simulation Summary worksheet
- 5 **If building uses more than one fossil fuel or uses oil instead of gas for heating, adjustments are needed.**

**Step1: Baseline Design (copy runs corresponding to four exposures from <project name>-Parms.csv to row 13-16 below)**

| Run Type | Internal Loads | Case #s | Short Name | Carry Fwd | Incremental First Cost (\$) | Incremental Annual Maint. (\$) | Date & Time of Run | File Name |
|----------|----------------|---------|------------|-----------|-----------------------------|--------------------------------|--------------------|-----------|
|----------|----------------|---------|------------|-----------|-----------------------------|--------------------------------|--------------------|-----------|

**Average of 4 exposures (needed in Simulation Summary)**

**Step2: Proposed Design (copy run that corresponds to proposed design from <project name>-Parms.csv to row 19 below)**

**Step3: Energy Savings By Measure (copy runs that correspond to EACH parametric run from <project name>-Parms.csv to r**

| Run Type | Internal Loads | Case #s | Short Name | Carry Fwd | Incremental First Cost (\$) | Incremental Annual Maint. (\$) | Date & Time of Run | File Name |
|----------|----------------|---------|------------|-----------|-----------------------------|--------------------------------|--------------------|-----------|
|----------|----------------|---------|------------|-----------|-----------------------------|--------------------------------|--------------------|-----------|

(these rows can be manually entered for calculations done outside of eQuest such as Solar Hot Water, Solar PV, etc)

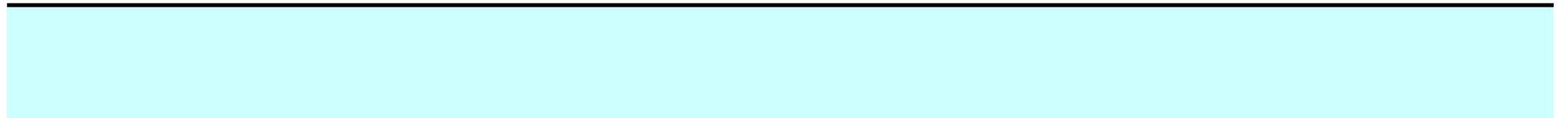


| Annual Other                  | Annual Other                       | Annual Appliance                 | Annual Heating                         | Annual Hot Water                     | Annual Other                     |                      | Annual Lighting                                    | Annual Lighting                  |
|-------------------------------|------------------------------------|----------------------------------|--|--------------------------------------|----------------------------------|----------------------|--|----------------------------------|
| PS-E<br>Pumps<br>& Aux<br>kWh | PS-E<br>Ventilation<br>Fans<br>kWh | PS-E<br>Refrig<br>Display<br>kWh | PS-E<br>Heat Pump<br>Supplement<br>kWh | PS-E<br>Domestic<br>Hot Water<br>kWh | PS-E<br>Exterior<br>Usage<br>kWh | PS-E<br>Total<br>kWh | Fuel Usage:<br>PS-E<br>Ambient<br>Lights<br>Therms | PS-E<br>Task<br>Lights<br>Therms |
| #DIV/0!                       | #DIV/0!                            | #DIV/0!                          | #DIV/0!                                | #DIV/0!                              | #DIV/0!                          | #DIV/0!              | #DIV/0!  | #DIV/0!                          |

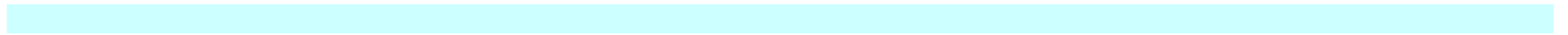
|                       |                            |                          |                                |                              |                          |              |                             |                          |
|-----------------------|----------------------------|--------------------------|--------------------------------|------------------------------|--------------------------|--------------|-----------------------------|--------------------------|
| Pumps<br>& Aux<br>kWh | Ventilation<br>Fans<br>kWh | Refrig<br>Display<br>kWh | Heat Pump<br>Supplement<br>kWh | Domestic<br>Hot Water<br>kWh | Exterior<br>Usage<br>kWh | Total<br>kWh | Ambient<br>Lights<br>Therms | Task<br>Lights<br>Therms |
|-----------------------|----------------------------|--------------------------|--------------------------------|------------------------------|--------------------------|--------------|-----------------------------|--------------------------|

| Annual Appliance | Annual Heating | Annual Cooling | Annual Cooling | Annual Other | Annual Other | Annual Appliance | Annual Heating | Annual Hot Water |
|------------------|----------------|----------------|----------------|--------------|--------------|------------------|----------------|------------------|
|------------------|----------------|----------------|----------------|--------------|--------------|------------------|----------------|------------------|

|                                 |                                    |                                    |                                  |                                  |                                       |                                     |   |   |
|---------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|---------------------------------------|-------------------------------------|---|---|
| PS-E<br>Misc<br>Equip<br>Therms | PS-E<br>Space<br>Heating<br>Therms | PS-E<br>Space<br>Cooling<br>Therms | PS-E<br>Heat<br>Reject<br>Therms | PS-E<br>Pumps<br>& Aux<br>Therms | PS-E<br>Ventilation<br>Fans<br>Therms | PS-E<br>Refrig<br>Display<br>Therms | PS-E<br>Heat Pump<br>Supplement<br>Therms | PS-E<br>Domestic<br>Hot Water<br>Therms |
|---------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|---------------------------------------|-------------------------------------|---|---|



|         |         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|



|                         |                            |                            |                          |                          |                               |                             |                                   |                                 |
|-------------------------|----------------------------|----------------------------|--------------------------|--------------------------|-------------------------------|-----------------------------|-----------------------------------|---------------------------------|
| Misc<br>Equip<br>Therms | Space<br>Heating<br>Therms | Space<br>Cooling<br>Therms | Heat<br>Reject<br>Therms | Pumps<br>& Aux<br>Therms | Ventilation<br>Fans<br>Therms | Refrig<br>Display<br>Therms | Heat Pump<br>Supplement<br>Therms | Domestic<br>Hot Water<br>Therms |
|-------------------------|----------------------------|----------------------------|--------------------------|--------------------------|-------------------------------|-----------------------------|-----------------------------------|---------------------------------|





**Instructions:**

- 1 First fill in the Basic Info worksheet and copy results into Result Summary eQUEST worksheet.
- 2 Fill in cells highlighted with this color.
- 3 If oil is used rather than natural gas, modifications to table are needed.
- 4 Baseline and Proposed design fuel usage is copied from the corresponding rows in Result Summary eQUEST worksheet.
- 5 Performance rating is shown in **Red Font**
- 6 Energy cost savings associated with on-site power generation, including cogeneration, photovoltaics, and wind turbines, may not be used to r

**Building Area Summary (conditioned spaces only)**

| Space Type        | Area, SqFt | Notes   |
|-------------------|------------|---|
| Residential       | 0          | Include total floor area of all residential units in building                                   |
| Common Area       | 0          | Include combined floor area of residential-associated spaces (corridors, recreation areas, lo   |
| Commercial Area   | 0          | Include combined floor area of nonresidential spaces (commerical, office, retail, food sales, e |
| Garage            | 0          | Include floor area of enclosed/underground garages  |
| Total Conditioned | 0          |   |

**Fuel Cost**

|             |  |           |
|-------------|--|-----------|
| Electricity |  | \$/kWh    |
| Natural Gas |  | \$/Therm  |
| Fuel Oil    |  | \$/Gallon |

**Performance Rating Calculation**

|                                | Baseline         |                  |          | Proposed         |                  |          |
|--------------------------------|------------------|------------------|----------|------------------|------------------|----------|
|                                | Fossil Fuel, Btu | Electricity, Btu | Cost, \$ | Fossil Fuel, Btu | Electricity, Btu | Cost, \$ |
| Annual Heating                 | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| Annual Cooling                 | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| Annual Lighting                | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| Annual Hot Water               | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| Annual Appliance               | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| Annual Other                   | #DIV/0!          | #DIV/0!          | #DIV/0!  | 0                | 0                | \$0.00   |
| <i>Total without Renewable</i> | #DIV/0!          | #DIV/0!          | #DIV/0!  | -                | -                | \$0.00   |
| <i>Annual Renewable</i>        | 0                | 0                | \$0.00   |                  |                  | \$0.00   |
| <i>Total with Renewable</i>    | #DIV/0!          | #DIV/0!          | #DIV/0!  | -                | -                | \$0.00   |

|         |
|---------|
| #DIV/0! |
| #DIV/0! |

**Utility Bill Comparison**

|                             | Baseline            |                  |          | Proposed            |                  |          |
|-----------------------------|---------------------|------------------|----------|---------------------|------------------|----------|
|                             | Fossil Fuel, therms | Electricity, kWh | Cost, \$ | Fossil Fuel, therms | Electricity, kWh | Cost, \$ |
| Annual Heating              | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| Annual Cooling              | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| Annual Lighting             | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| Annual Hot Water            | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| Annual Appliance            | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| Annual Other                | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |
| <i>Total with Renewable</i> | #DIV/0!             | #DIV/0!          | #DIV/0!  | 0                   | 0                | \$0.00   |

**Energy Usage per Square Foot of Conditioned Area**

|                                | Baseline | Proposed |
|--------------------------------|----------|----------|
|                                | Btu/SqFt | Btu/SqFt |
| Annual Heating                 | 0        | 0        |
| Annual Cooling                 | 0        | 0        |
| Annual Lighting                | 0        | 0        |
| Annual Hot Water               | 0        | 0        |
| Annual Appliance               | 0        | 0        |
| Annual Other                   | 0        | 0        |
| <i>Total without Renewable</i> | 0        | 0        |

meet the Performance Target of 15%, but can be listed in Row 31.

|               |
|---------------|
|               |
|               |
| obbies, etc.) |
| etc.)         |
|               |

| Site BTU Savings, % | \$ Savings, %  |
|---------------------|----------------|
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | #DIV/0!        |
| #DIV/0!             | <b>#DIV/0!</b> |
| 0.00%               | 0.00%          |
| #DIV/0!             | <b>#DIV/0!</b> |

average monthly gas costs per apartment  
average monthly electricity costs per apartment

