



**HOUSTON RESIDENTIAL ENERGY CODE
 15% PRESCRIPTIVE OPTION PACKAGE FORM
 (MULTI-FAMILY STRUCTURES UP TO 3 STORIES)**

Introduction

This form should be completed when using the Houston Prescriptive Option Packages for compliance with the Houston Energy Code 15% above code provisions. These packages have been modeled by Texas A&M Energy Systems Lab to give an additional option for compliance. **This form is for multi-family structures.**

Instructions

Indicate which option package you have chosen by checking the applicable box in the "Group" Column. Please note that all items in the package must be met to achieve a minimum of 15% compliance.

PROJECT INFORMATION

Project Address: _____

Project No.: _____

OPTION PACKAGES FOR MULTI-FAMILY WITH ELECTRIC RESISTANCE HEATING

GROUPS	MEASURES	EXPLANATION
Group 1 <input type="checkbox"/>	<ul style="list-style-type: none"> PV Array for Partial Demand at 2kW/unit 	<u>Photovoltaic Array for Partial Demand at 2kW per unit:</u> <i>Installed according to DC Standard Test Criteria and manufacturer's instructions</i>
Group 2 <input type="checkbox"/>	<ul style="list-style-type: none"> Solar DHW System (21 sq. ft. collector area/unit) 	<u>Solar Domestic Hot Water System:</u> <i>Storage tank type DHW heater with 21 square feet collector area per unit is required for multifamily structures. The domestic water system is powered by solar power. This option will require additional plan requirements. Please see Solar Guideline Form 1198. This will require a minimum 21 sq. ft. collector.</i>
Group 3 <input type="checkbox"/>	<ul style="list-style-type: none"> 50% Energy Star CFL Indoor Lamps Mechanical in Conditioned Space Improved SEER (minimum 14) Decreased SHGC (maximum .35) and U-factor (0.35 maximum) Decreased Infiltration (maximum .35 ACHn) 	<u>50% Energy Star CFL Indoor Lamps:</u> <i>Permanent Compact Florescent fixtures excluding closets. This package will require the installation of 50% of the lighting fixtures (excluding closets). These fixtures are required to be "pin based" fixtures.</i> <u>Mechanical Systems within Conditioned Spaces</u> (upper floor only in multifamily): <i>Ducts in ventilated attic moved into a location within the thermal envelope of conditioned space including unventilated attic space. This option package will require that the heating, ventilation and AC ducts are moved inside the conditioned building envelope.</i> <u>Improved SEER:</u> (minimum 14 for multi-family units): <i>Manufacturer's nominal rating.</i> <u>Decreased SHGC</u> (maximum .35) & U-factor (maximum .35): <i>NFRC 100 and 200. These values may be averaged.</i> <u>Decreased Infiltration</u> (maximum .35 ACHn): <i>Base case formula for ACHn is Normalized Leakage 0.57 x Weather Factor 0.8 Less infiltration can be achieved by improving the sealing and gasketing of the envelope. This option package will require a blower door test to confirm air leakage is less then .35ACHn. This test shall be performed by an approved third party.</i>
Group 4 <input type="checkbox"/>	<ul style="list-style-type: none"> Tankless water heater (minimum .748 Energy Factor) Decreased Duct Leakage (maximum 6%) <i>Upper Floor Only</i> Improved SEER (minimum 14) Reduced Infiltration (maximum .35 ACHn) 25% Energy Star CFL Indoor Lamps Decreased SHGC (maximum .35) and U-factor (0.35 maximum) 	<u>Tankless water heater</u> (minimum .748 Energy Factor for Electric/Gas unit): <i>Manufacturer's rating. Tankless water heater that will serve the domestic hot water for the unit is required with a minimum efficiency of .748 or higher.</i> <u>Decreased Duct Leakage</u> (maximum 6%): <i>Ducts tested with less than 6 % leakage to outside the building envelope.</i> <u>Improved SEER:</u> (Minimum 14 for multi-family units): <i>Manufacturer's nominal rating.</i> <u>Decreased Infiltration</u> (maximum .35 ACHn): <i>Base case formula for ACHn is Normalized Leakage 0.57 x Weather Factor 0.8 Less infiltration can be achieved by improving the sealing and gasketing of the envelope. This option package will require a blower door test to confirm air leakage is less then .35ACHn. This test shall be performed by an approved third party.</i> <u>25% Energy Star CFL Indoor Lamps:</u> <i>Permanent Compact Florescent fixtures excluding closets. These fixtures are required to be "pin based" fixtures.</i> <u>Decreased SHGC</u> (maximum .35) & U-factor (maximum .35): <i>NFRC 100 and 200. These values may be averaged.</i>
Group 5 <input type="checkbox"/>	<ul style="list-style-type: none"> 50% Energy Star CFL Indoor Lamps Decreased Duct Leakage (maximum 10%) Improved SEER (minimum 14) Decreased SHGC (maximum .35) and U-factor (0.35 maximum) Reduced Infiltration (maximum .35 ACHn) 	<u>50% Energy Star CFL Indoor Lamps:</u> <i>Permanent Compact Florescent fixtures excluding closets. This package will require the installation of 50% of the lighting fixtures (excluding closets). These fixtures are required to be "pin based" fixtures.</i> <u>Decreased Duct Leakage</u> (maximum 10%): <i>Ducts tested with less than 10 % leakage to outside the building envelope.</i> <u>Improved SEER:</u> (minimum 14 for multi-family units): <i>Manufacturer's nominal rating.</i> <u>Decreased SHGC</u> (maximum .35) & U-factor (maximum .35): <i>NFRC 100 and 200. These values may be averaged.</i> <u>Decreased Infiltration</u> (maximum .35 ACHn): <i>Base case formula for ACHn is Normalized Leakage 0.57 x Weather Factor 0.8. Less infiltration can be achieved by improving the sealing and gasketing of the envelope. This option package will require a blower door test to confirm air leakage is less then .35ACHn. This test shall be performed by an approved third party.</i>



**HOUSTON RESIDENTIAL ENERGY CODE
 15% ABOVE PHASED OPTION PACKAGE FORM
 (MULTI-FAMILY STRUCTURES)**

OPTION PACKAGES FOR MULTI-FAMILY WITH NATURAL GAS HEATING

GROUPS	MEASURES	EXPLANATION
Group 1 <input type="checkbox"/>	<ul style="list-style-type: none"> Solar Domestic Hot Water System (21 sq. ft. collector area/unit) 	<p><u>Solar Domestic Hot Water System</u>: Storage tank type DHW heater with 21 square feet collector area per unit is required for multifamily structures. The domestic water system is powered by solar power. This option would require additional plan requirements. Please see Solar Guideline Form 1198. This will require a minimum 21 sq. ft. collector.</p>
Group 2 <input type="checkbox"/>	<ul style="list-style-type: none"> Photovoltaic Array for 2kW/unit 	<p><u>Photovoltaic Array for Partial Demand at 2kW per unit</u>: Installed according to DC Standard Test Criteria and manufacturer's instructions</p>
Group 3 <input type="checkbox"/>	<ul style="list-style-type: none"> 50% Energy Star CFL Indoor Lamps Tankless water heater (minimum .748 Energy Factor) Decreased Infiltration (maximum .35 ACHn) 	<p><u>50% Energy Star CFL Indoor Lamps</u>: Permanent Compact Florescent fixtures excluding closets. This package will require the installation of 50% of the lighting fixtures (excluding closets). These fixtures are required to be "pin based" fixtures.</p> <p><u>Tankless water heater (minimum .748 Energy Factor for Electric/Gas unit)</u>: Manufacturer's rating. Tankless water heater that will serve the domestic hot water for the unit is required with a minimum efficiency of .748 or higher.</p> <p><u>Decreased Infiltration (maximum .35 ACHn)</u>: Base case formula for ACHn is Normalized Leakage 0.57 x Weather Factor 0.8 Less infiltration can be achieved by improving the sealing and gasketing of the envelope. This option package will require a blower door test to confirm air leakage is less then .35ACHn. This test shall be performed by an approved third party.</p>
Group 4 <input type="checkbox"/>	<ul style="list-style-type: none"> Tankless water heater (minimum .748 Energy Factor) Decreased Duct Leakage (maximum 10%) Upper Floor Only Improved SEER (minimum 14) 	<p><u>Tankless water heater (minimum .748 Energy Factor for Electric/Gas unit)</u>: Manufacturer's rating. Tankless water heater that will serve the domestic hot water for the unit is required with a minimum efficiency of .748 or higher.</p> <p><u>Decreased Duct Leakage (maximum 10%)</u>: Ducts tested with less than 10 % leakage to outside the building envelope.</p> <p><u>Improved SEER</u>: (Minimum 14 for multi-family units): Manufacturer's nominal rating.</p>
Group 5 <input type="checkbox"/>	<ul style="list-style-type: none"> Mechanical Systems within Conditioned Spaces Upper Floor Only Decreased Infiltration (maximum .35 ACHn) Improved SEER (minimum 14) Improved Furnace Efficiency (minimum .93 AFUE) 50% Energy Star CFL Indoor Lamps 	<p><u>Mechanical Systems within Conditioned Spaces</u> (upper floor only in multifamily): Ducts in ventilated attic moved into a location within the thermal envelope of conditioned space including unventilated attic space. This option package will require that the heating, ventilation and AC ducts are moved inside the conditioned building envelope.</p> <p><u>Decreased Infiltration (maximum .35 ACHn)</u>: Base case formula for ACHn is Normalized Leakage 0.57 x Weather Factor 0.8 Less infiltration can be achieved by improving the sealing and gasketing of the envelope. This option package will require a blower door test to confirm air leakage is less then .35ACHn. This test shall be performed by an approved third party.</p> <p><u>Improved SEER</u>: (Minimum 14 for multi-family units): Manufacturer's nominal rating.</p> <p><u>Improved Furnace Efficiency (Minimum .93 AFUE)</u>: Manufacturer's nominal rating.</p> <p><u>50% Energy Star CFL Indoor Lamps</u>: Permanent Compact Florescent fixtures excluding closets. This package will require the installation of 50% of the lighting fixtures (excluding closets). These fixtures are required to be "pin based" fixtures.</p>
Group 6 <input type="checkbox"/>	<ul style="list-style-type: none"> Tankless water heater (minimum .748 Energy Factor) Decreased Duct Leakage (maximum 10%) Upper Floor Only 50% Energy Star CFL Indoor Lamps Decreased SHGC (Maximum .35) & U-factor (Maximum .35) 	<p><u>Tankless water heater (minimum .748 Energy Factor for Electric/Gas unit)</u>: Manufacturer's rating. Tankless water heater that will serve the domestic hot water for the unit is required with a minimum efficiency of .748 or higher.</p> <p><u>Decreased Duct Leakage (maximum 10%)</u>: Ducts tested with less than 10 % leakage to outside the building envelope.</p> <p><u>50% Energy Star CFL Indoor Lamps</u>: Permanent Compact Florescent fixtures excluding closets. This package will require the installation of 50% of the lighting fixtures (excluding closets). These fixtures are required to be "pin based" fixtures.</p> <p><u>Decreased SHGC</u> (maximum .35) & U-factor (maximum .35): NFRC 100 and 200. These values may be averaged.</p>