

Green Building Energy Sustainability Inc.

Residential Energy Path Document

Purpose: This document is designed to communicate all Pre Permitting, Energy Report, and Energy Inspection requirements necessary for project completion. If you want your project to move quickly and easily through the permitting process, then you need to change your process and considerations.

Reason: The cities in the North Texas area are changing their permitting requirements to more closely follow requirements in the 2021 IECC (International Energy Compliance Code). They have created some unique optional packages that should be considered before starting your project. Things are changing and so must all the rest of us. There are also advantages to select a different energy path that can provide benefits to new owners and marketing the house that may justify these changes.

Considerations: Type of project

1. **New Construction**
2. **Addition**
3. **Renovation / Repair**

Pre Permitting requirements:

1. Most of the cities in North Texas now require an Energy Path document when submitting documents for your Permit.
2. The submitted plans **MUST** have the insulative building envelope indicated on the floor and elevational plans so it is indicated where the air barrier will be installed on the building. Change your contract with your Architect so this detail is on all your plans.
3. Manual J (Heat Load Calculations) reports have been required by the Energy code since 2003, but poorly enforced by the cities. That is evolving with these other changes in Permitting policy.
 - Past HVAC practices estimated about 1 ton of Air Conditioning per 500 sqft of house.
 - For 2021 IECC houses, Manual J's typically indicate that now only require about 1 ton for 750 sqft.

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- That is a 50% reduction in Cooling equipment.
- HVAC systems need to be smaller to eliminate moisture problems in the new houses.
- Furnaces are typically oversized by about 130% for this zone basically because it takes a certain size air handler to meet the airflow for the cooling loads. These units can be derated to use less energy.
- Cities expect to start requiring Manual J calculation starting this fall in 2021. Several cities are already requiring the Manual J at permitting.

Compliance path options;

Prescriptive Path – This path to compliance uses prescriptive values that are found directly in the 2021 IECC tables. All required values are posted in the 2021 IECC codebook. This is the most basic and easiest path for compliance, however, it has some significant components to consider.

- The wall insulation requirement in this path is R-20 which uses high-density insulation such as fiberglass batt or open cell foam in a 2x6 wall system.
- This path works very well for projects that do not have an HVAC-conditioned area such as a detached garage that does not have an insulation requirement built with a 2x4 wall system or a limited renovation/repair project that falls under Chapter 5 (Existing Buildings) of the 2021 IECC.
- This path does not require a separate Energy Report.

UA (U-value of the Assembly) Path – The path to compliance is determined by computer software that only considers the foundation, floor, wall, ceiling insulation as well as doors, windows, and skylights.

- Very limited trade-offs are allowed between these components to demonstrate compliance with the 2021

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IECC when compared to a reference house based on the prescriptive path.

- This path works well for additions and renovation/repair projects where the scope of energy component work is limited in nature.
- Existing building renovation/repairs projects have all the rest of the house that are exempt from IECC improvements.
- Only the areas being changed have to comply with Chapter 5 (Existing Buildings) of the 2015 IECC.
- Additions must comply with the new construction requirements with Wall R-19/20 requirements (2x6 construction) or R-13 (2x4 construction with some amount of continuous insulation 4x8 foam sheets).
- Ceiling insulation requirements are typically required to go to R-38 in project areas.
- Energy reports are required to show compliance. ResCheck and other software such as RemRate or Ektotrope can demonstrate a UA Compliance path.

Performance Path – This is an alternative compliance path that uses energy cost as a basis of comparison to the standard reference house.

- The performance path expands the components that can be considered for tradeoffs, but the tradeoffs are limited to the values established in the 2009 IECC (such as R-13 wall insulation and R-30 ceiling insulation values). This path allows for R-13 walls (2x4 construction without or only slight continuous insulation foam sheets).

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- This path works well on new construction and additions that are new buildings that are attached to existing buildings
- The performance path considers alternative insulation schemes such as foam encapsulation and crawlspace enclosure.
- The performance path also includes some HVAC system considerations and building airtightness
- This path also helps if there are fewer, more efficient windows and more efficient HVAC systems (16 SEER or better).
- A blower door test is required for new construction with a maximum limit of 3 Air Changes per Hour (ACH).
- A Duct pressurization test is required in any HVAC components are outside the Building Envelope
- An Energy Report is required to demonstrate 2021 IECC compliance.

EnergyStar Path – This is a path included in the state legislation because of its past energy efficiency performance history.

- It has been overshadowed by the 2021 IECC performance path recently because of the improved efficiencies and tradeoff options in the performance path.
- EnergyStar is a defined options package that does not allow other tradeoffs.
- EnergyStar is moving from Version 3.0 to 3.1 on July 1st, 2018 in Texas.

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ERI Path – The Energy Reference Index (ERI) path is based on the success of the RESNET HERS (Home Energy Rating System).

- Currently, only HERS is an approved ERI path, but new software programs are starting to come online that can generate an ERI report that is not a RESNET propriety HERS report.
- The ERI path allows for a complete set of tradeoff options but is still limited to minimum values established in the 2009 IECC.
- Texas does not allow for onsite energy production to be considered in the ERI score and has modified the maximum ERI score to allow the path to be competitive for current construction practices.
- In the DFW area (Zone 3), the maximum ERI score is 63 but will move to 59 on September 1st 2022
- A blower door test is required for new construction with a maximum limit of 3 Air Changes per Hour (ACH).
- An Energy Report is required to demonstrate 2021 IECC compliance.
- HERS scores are now recorded in a national directory that will indicate higher values and energy efficiency for Appraisers and Real Estate agents in future sales. That historical record may be worth the slight increase in cost for a HERS report.

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Optional Path – This is an alternative path that is designed to help builders and contractors comply with the 2021 IECC that have problems meeting 3 Air Changes per Hour (ACH).

- This back-door path allows for 4 ACH, but requires that windows have a lower U Value (.32 compared to .35)
- R-49 ceiling insulation (compared to R-38).
- It is easy to add more insulation but a real problem is to change out every window and window frame at the end of the project to meet the more efficient window U value requirements.
- An Energy Report is required to demonstrate 2021 IECC compliance.
- **GBES** designs a maximum .32 U value in all our energy reports just to keep this option open if the house cannot make 3 ACH.

Dallas Green Building Program

The City of Dallas also has a Green Building program to cover new construction and additions greater than 200 sqft. Detached Garages over 400 sqft will be placed in this program.

- This program includes Water Efficiency (2 GPM for showers and bathroom faucets as well as 1.3 GPF or dual flush toilets), Energy Efficiency, Heat Island Mitigation (Foam encapsulation or radiant barrier), and Indoor Air Quality (tighter Building Envelope between the garage and the house, as well as better MERV 8 air filters in your HVAC system).
- This program requires a Plan Review, Checklist, inspections and Affidavits.

Green Building Energy Sustainability Inc. provides Green Building Plan Reviews, Energy Reports, Manual J/S/D Calculations, Energy Inspections, Duct Pressurization test, Blower Door test, Infrared Scans, and consulting service to help you meet the challenges on the 2021 Energy code. One call handles it all, that's why you need A Closer Look. Give us a call today at **214-244-3118** and let us help you make your property more energy-efficient, get your Permit and Certificate of Occupancy.