Nebraska Energy Code

2018 IECC Compliance Issues and Solutions

Nebraska Energy Code Training Program

Instructor: Matt Belcher

October 11, 2023

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Housekeeping

- Attendees are muted upon entry
- Questions? Enter them in the chat box or unmute
- Webinar is being recorded – slides and recording will be sent to attendees and posted on website
- CEUs from ICC and AIA provided
- Email jgossman@mwalliance.org with questions

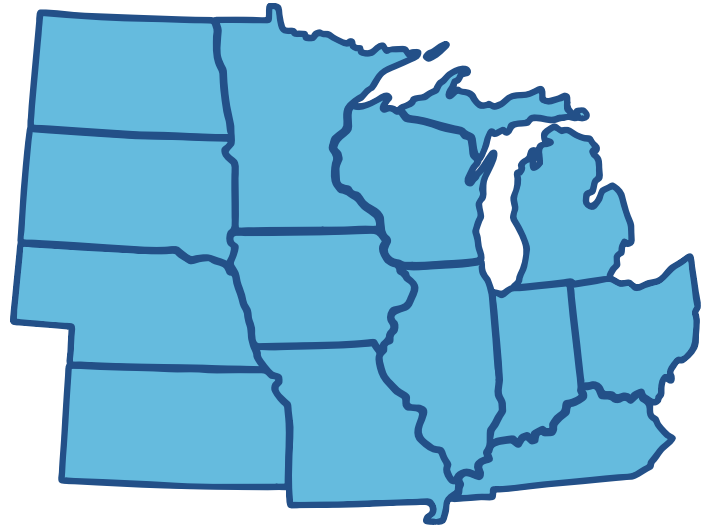
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

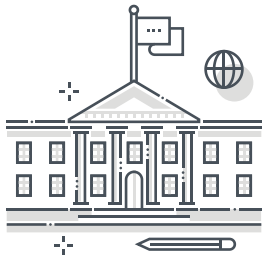
Midwest Energy Efficiency Alliance

The Midwest Energy Efficiency Alliance (MEEA) is a collaborative network, promoting energy efficiency to optimize energy generation, reduce consumption, create jobs and decrease carbon emissions in all Midwest communities.



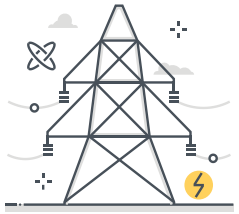
MEEA is a non-profit membership organization with 150+ members, including:

Energy service companies & contractors



State & local governments

Academic & research institutions



Electric & gas utilities

About the Nebraska Training Program

- Goal: prepare the Nebraska workforce for upcoming changes in construction best practices
  - Residential and Commercial Energy Code
  - Building Science
  - Practical Solutions
- Focused on providing training to builders, code officials, design professionals, public officials and students
- For more information, visit: https://www.mwalliance.org/nebraska-energy-codes-training-program

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Training Objectives

- What is the 2018 Energy Code?
- Inside the Energy Code:
  - Building Envelope
  - Interior Comfort/Health
  - Remodeling/Rehab
  - Local Application/Amendments

- '21 Code → '24 National Standard
- Marketing Energy Efficient/High Performance Buildings

ICC
INTERNATIONAL CODE COUNCIL®

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL®

Nebraska's New Energy Code

- Nebraska adopted the full suite of 2018 International Code Council's (ICC) Codes, including the unamended International Energy Conservation Code (IECC)
- The IECC…
  - Applies to new and renovated buildings
  - Sets minimum requirements for energy features and performance
  - Reduces energy use and polluting emissions over the life of complying buildings
  - Benefits commercial building owner, homeowners, and society by improving cost-effectiveness, comfort, productivity, and durability
- The IECC covers both residential and commercial buildings, but we are focused on commercial today

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

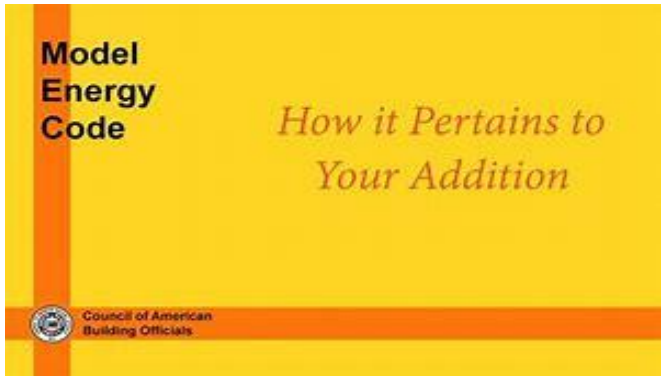
NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

The 2018 IECC

The Energy Code

- Model Energy Code (MEC) developed in 1983 under a U.S. Dept of Energy Contract
- Editions of the MEC released from 1983-1995
- Title changed to International Energy Conservation Code in 1998

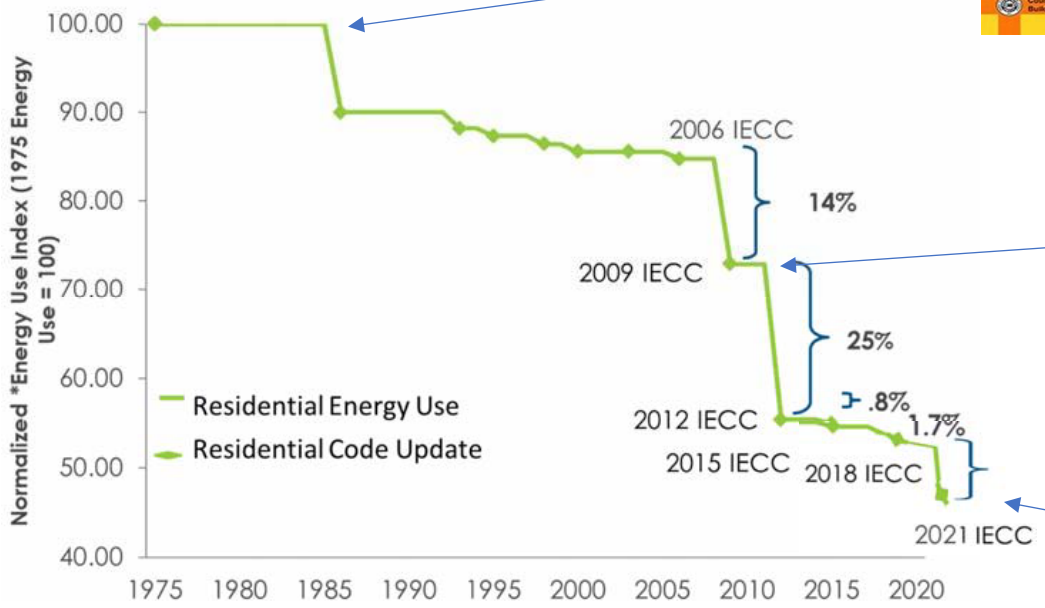


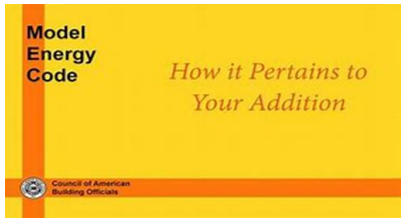
MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

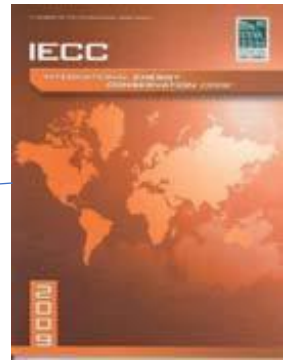
NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA
CODE OFFICIALS
ASSOCIATION
ICC
INTERNATIONAL
CODE COUNCIL

Energy Code Background







MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Nebraska Residential Field Study

- Conducted in 2017 by **Nebraska Department of Environment and Energy.** 2009 IECC was the baseline.
- Collected and analyzed several data points for new homes, including:
  - Envelope air leakage
  - Efficacy in lighting
  - Duct leakage
  - Ceiling & exterior wall insulation
  - Basement & slab insulation
  - Windows

For More Information and Data:

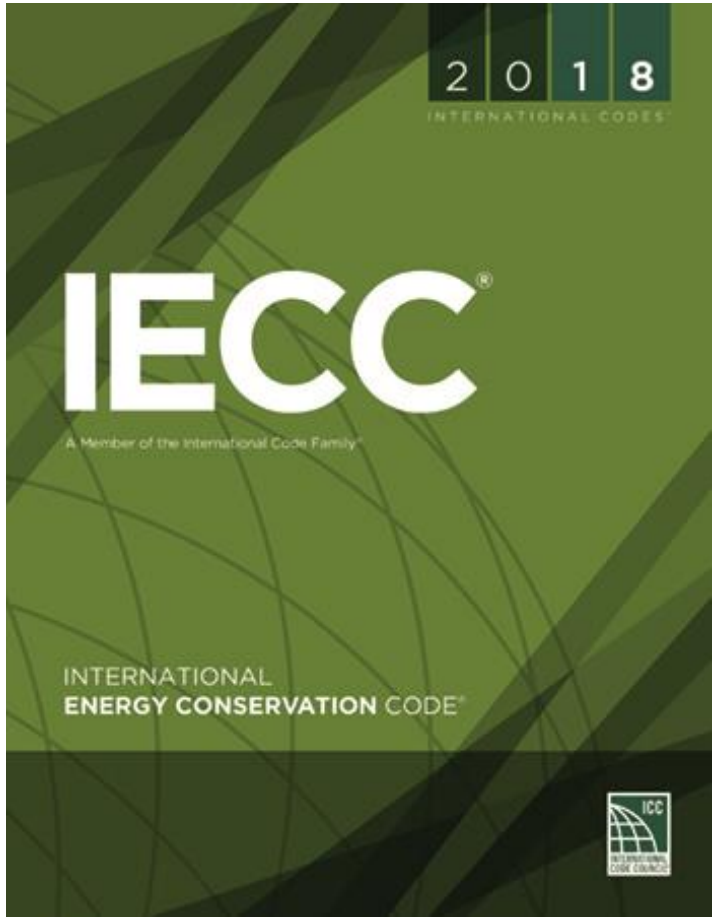
https://www.energycodes.gov/sites/default/files/documents/Nebraska_Residential_Compliance_Evaluation_final.pdf

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

So, What's Changed since 2009?



2018 IECC / IRC Section 11

- Creates a Residential Energy Code separate from the Commercial Energy Code
- Adds testing and verification requirements
- Promotes Innovation through Energy Ratings Index (ERI)
  - Uses a HERS-type index as an "equivalent" for residential applications
  - Mandatory requirements still apply

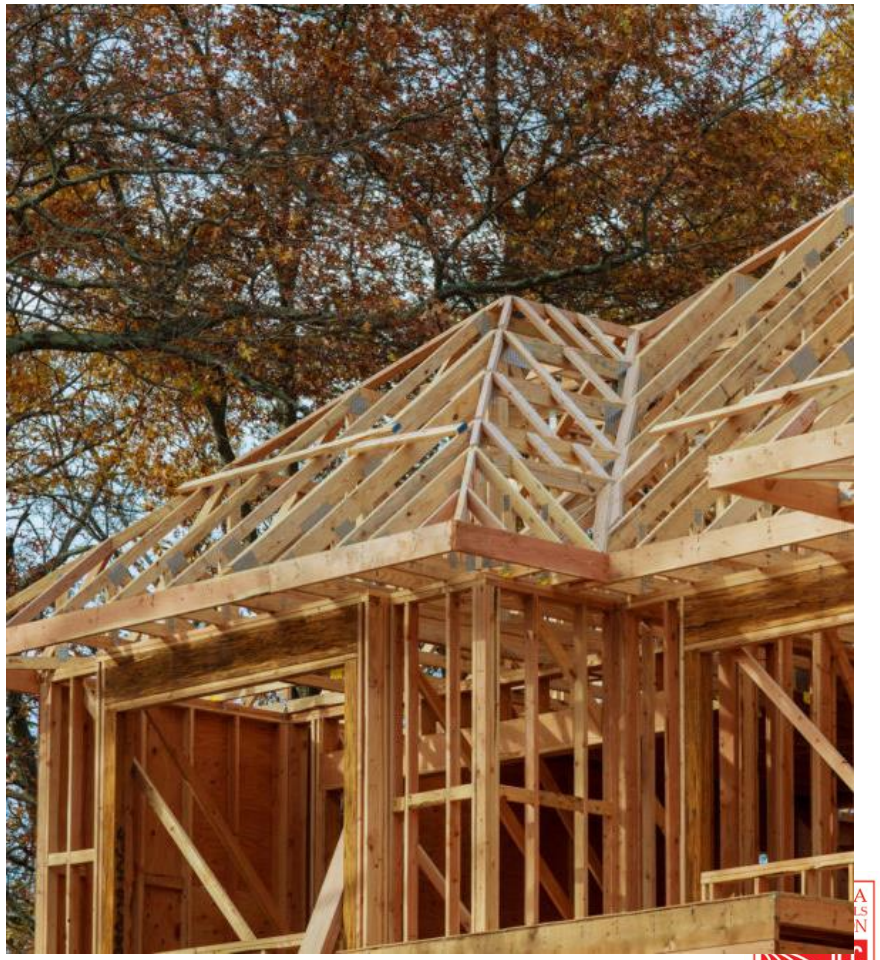
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

The Energy Code is Everywhere

- Unlike most other codes, the energy code directly impacts the work of many disparate building trades and systems, including:
  - Framing/Envelope
  - Plumbing
  - HVAC
  - Electric
  - Moisture management
  - Concrete
  - Caulking



MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

INTERNATIONAL CODE COUNCIL

2018 IECC Mandatory Requirements

Energy Certificate

- Energy Certificate located on circuit breaker box includes key energy efficiency measures and is signed by the builder

Air Sealing

- All holes between floors and through exterior walls/ceilings have been sealed in **accordance with table R402.4.1.1**
- Building or dwelling unit is **tested to verify air leakage rate of ≤ 3 Air Changes per Hour (ACH)**
- Building or dwelling unit must have continuous air barrier installed

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

2018 IECC Mandatory Requirements

Ducts

- All ducts are sealed with approved materials (e.g. mastic or UL 181 tape) - duct tape is not acceptable
- All ducts outside conditioned space are tested to verify duct leakage with a total duct leakage or leakage to the outside test
- Supply & return ducts in attic insulated to ≥ R-6 when ducts are outside conditioned space and ≥ R-8 when ducts are outside the building thermal envelope

Building Cavities

- **Building framing cavities shall not be used as supply ducts or plenums**

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

2018 IECC Mandatory Requirements

Heating and Cooling

- Controls: Programmable thermostat installed
- Equipment sized per ACCA Manuals S & J

Lighting

- Minimum of **90% high-efficacy lamps** installed
- Recessed lighting in thermal envelope IC-rated and airtight

Mechanical Ventilation

- **Installed according to requirements in the International Mechanical Code**
- **Required for all homes ≤ 5 ACH per Section M303.4 (3 ACH is a 2018 IECC mandatory requirement)**

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

2018 IECC Mandatory Requirements

Other requirements

- Wood-burning fireplaces have tight flue dampers or doors, and outdoor combustion air
- Mechanical system piping insulated to min R-3 for fluids >105° F or <55° F
- Circulating hot water systems shall be insulated to at least R-2. Systems shall include an automatic, or readily accessible, off-switch.

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Energy Code Compliance Pathways

Prescriptive Method Requirements

- All mandatory and prescriptive requirements must be met

Total UA Method Requirements

- All mandatory and prescriptive requirements (other than Table R402.1.2) must be met
- Include documentation to demonstrate compliance with the UA Trade-off method. Compliance software submittal must include completed compliance form, inspection checklist and certificate demonstrating compliance with 2018 IECC levels

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Energy Code Compliance Pathways

Simulated Performance Requirements (Section R405)

- All mandatory requirements must be met
- Submit an energy cost analysis report which demonstrates that the proposed design (as built) home is more efficient than the standard reference design home

Energy Rating Index Requirements (Section R406)

- All Mandatory requirements met. Meet or exceed 2009 IECC prescriptive envelope requirements
- ERI score of 61 or lower. Submit report demonstrating compliance

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Structure of Commercial 2018 IECC

- Ch. 1 Scope and Application / Administrative and Enforcement
- Ch. 2 Definitions
- Ch. 3 General Requirements
- Ch. 4 Commercial Energy Efficiency
- Ch. 5 Existing Buildings
- Ch. 6 Referenced Standards
- Index

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

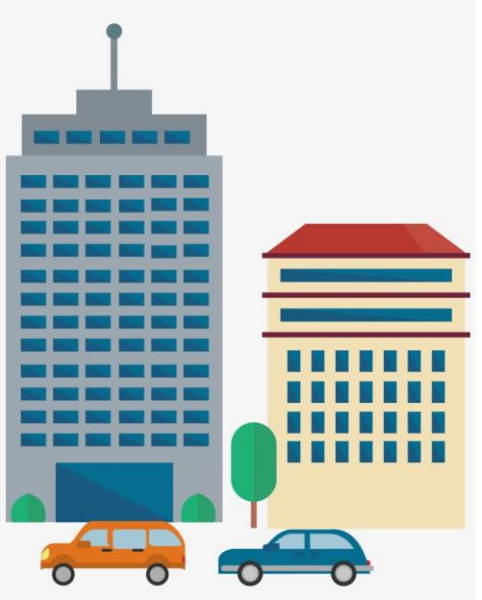
NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Commercial Buildings in the IECC

Under the Purview of the Commercial Code

- ✓ Buildings with commercial use
- ✓ Multifamily residential buildings four stories or greater in height



Not Under the Purview of the Commercial Code

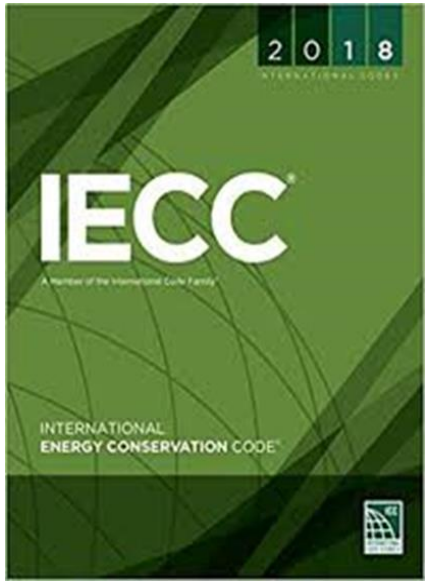
- × One- and two-family residential
- × R-2, R-3, R-4 three stories or less in height

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

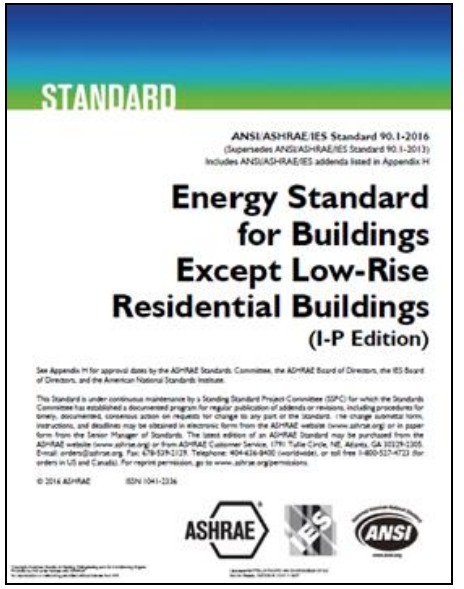
NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

New in 2018: *Two* Commercial Compliance Options



ASHRAE 90.1-2016

Alternative Method to IECC

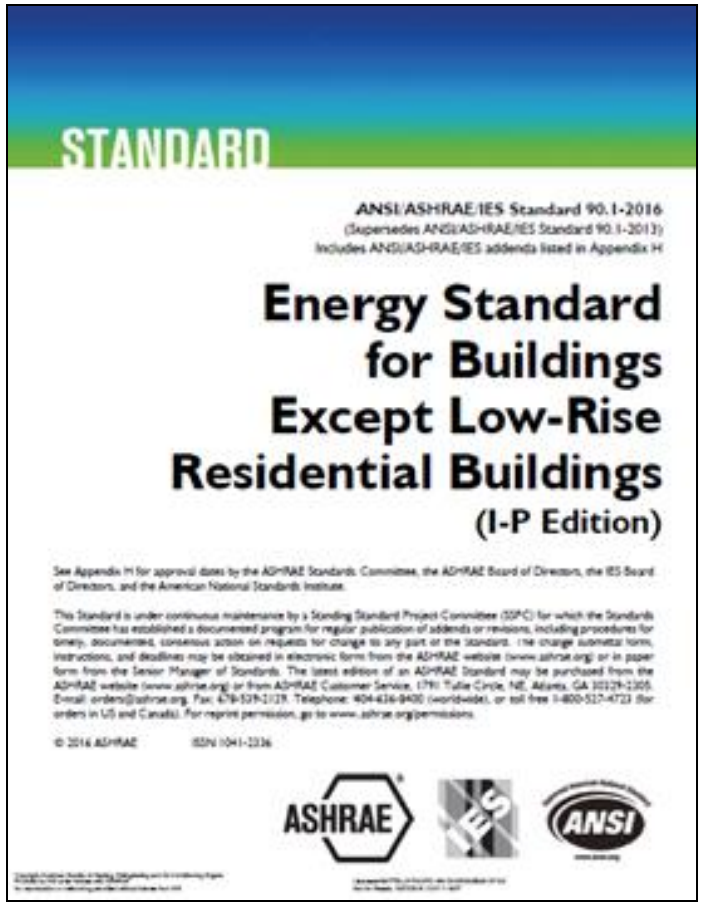


MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Structure of Standard 90.1-2016



1. Purpose
2. Scope
3. Definitions, Abbreviations & Acronyms
4. Administration and Enforcement
5. Building Envelope
6. Heating, Ventilating and Air Conditioning
7. Service Water Heating
8. Power
9. Lighting
10. Other Equipment
11. Energy Cost Budget Method
12. Normative References

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

What About Mixed Use? – C101.4.1

- Treat the residential building portion under the applicable residential code
- Treat the commercial building portion under the commercial code
- Code Official has final authority

Image: agarch.com

Commercial Compliance Options

ASHRAE 90.1-2016

OR

2018 IECC – Prescriptive

- ✓ C402 – Envelope
- ✓ C403 – Mechanical
- ✓ C404 – SWH
- ✓ C405 – Lighting

AND Pick **at Least One C406**:

- ❑ C406.2 – Eff. HVAC Performance
- ❑ C406.3 – Reduced Lighting Power
- ❑ C406.4 – Enhanced Lighting Controls
- ❑ C406.5 – On-site Supply of Renewable Energy
- ❑ C406.6 – Dedicated Outdoor Air System
- ❑ C406.7 – High Eff. Service Water Heating
- ❑ C406.8 – Enhanced Envelope Performance
- ❑ C406.9 – Reduced Air Infiltration

OR

2018 IECC – Performance

- C407 – Total Building Performance
- C402.5 – Air Leakage
- C403– Mandatory Mechanical Provisions
- C404 – SWH
- C405 - Lighting
- Building energy cost to be < 85% of standard reference design building

Building Envelope Compliance Options

3 Methods for compliance of building components:

- C402.1.3 – Insulation component R-value based method
- C402.1.4 – Assembly U-factor, C-factor or F-factor based method
- C402.1.5 – Component Performance Alternative

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Building Envelope

- All of the elements of the envelope and the assembly methods (and details) determine how well the building envelope performs.
- The building envelope must be an unbroken boundary surrounding the structure.
- All elements must be in close alignment with each other.

Photo courtesy of U.S. Gypsum

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Performance Testing

A Great Quality Control Tool

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Air Leakage & Continuous Air Barrier Testing
Section C402.5

- Continuous Air Barrier Required

- Two Compliance Options
  - ASTM E 779 (blower door test)
  - Compliant assemblies
    - C402.5.1 through C402.5.8

Image: energyconservatory.com

Ventilation and Air Sealing

- Both natural and mechanical ventilation provide fresh air that can dilute and remove indoor pollutant levels
- Per the IMC/IRC, mechanical ventilation is required when homes are <5 ACH 50
  - Need to do a blower door test to determine leakage rate
  - **Liability concerns when not performed**
- A blower door test measures a building's existing air leakage
- Can not design a code compliant system without knowing air leakage

Courtesy of AC Tool Supply, Inc.

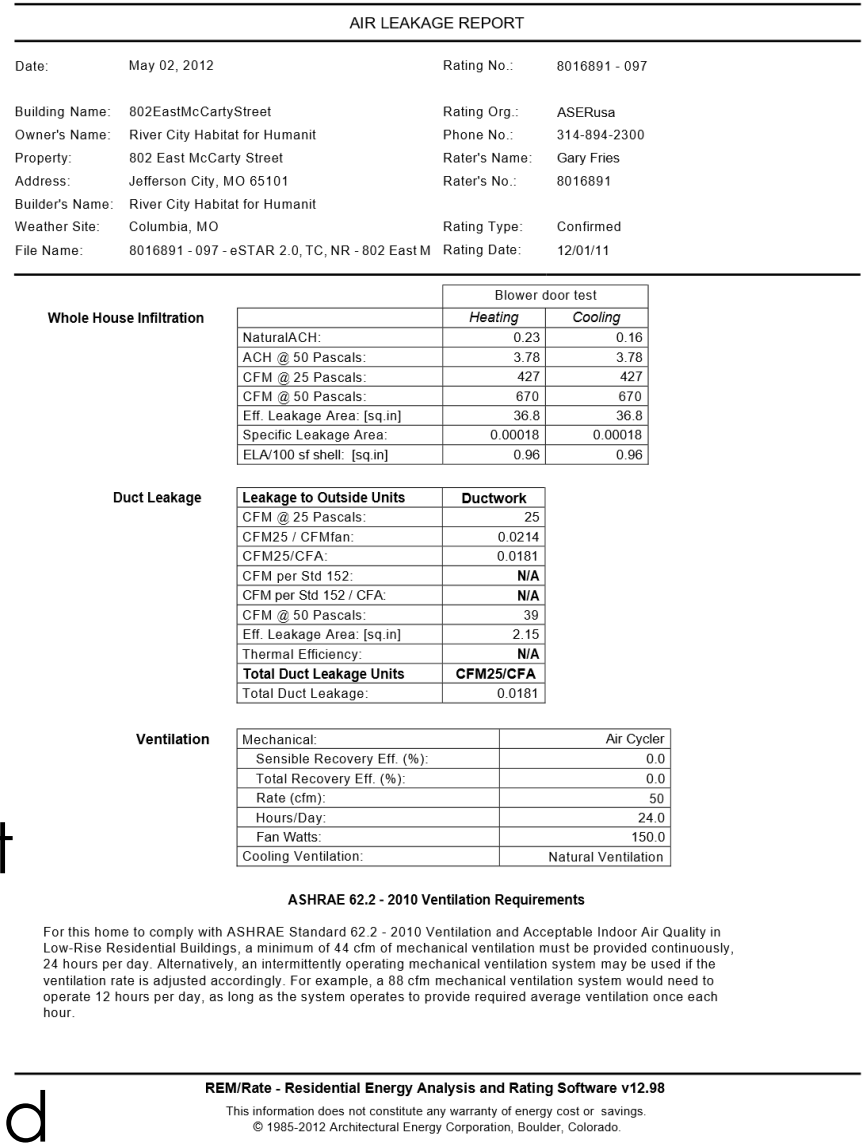
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Air Leakage Report

- Blower door test documents a home's air leakage performance
- Required by code
- Third party verification (some areas; performed by Inspectors)
- Provides solid data for final equipment adjustment and energy use/cost forecast
- Great liability protection for all involved



AIR LEAKAGE REPORT

Date:	May 02, 2012	Rating No.:	8016891 - 097
Building Name:	802EastMcCartyStreet	Rating Org.:	ASERusa
Owner's Name:	River City Habitat for Humanit	Phone No.:	314-894-2300
Property:	802 East McCarty Street	Rater's Name:	Gary Fries
Address:	Jefferson City, MO 65101	Rater's No.:	8016891
Builder's Name:	River City Habitat for Humanit		
Weather Site:	Columbia, MO	Rating Type:	Confirmed
File Name:	8016891 - 097 - eSTAR 2.0, TC, NR - 802 East M	Rating Date:	12/01/11

Whole House Infiltration

	Blower door test	
	Heating	*Cooling*
NaturalACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area: [sq.in]	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell: [sq.in]	0.96	0.96

Duct Leakage

Leakage to Outside Units	**Ductwork**
CFM @ 25 Pascals:	25
CFM25 / CFMfan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	**N/A**
CFM per Std 152 / CFA:	**N/A**
CFM @ 50 Pascals:	39
Eff. Leakage Area: [sq.in]	2.15
Thermal Efficiency:	**N/A**
Total Duct Leakage Units	**CFM25/CFA**
Total Duct Leakage:	0.0181

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff. (%):	0.0
Total Recovery Eff. (%):	0.0
Rate (cfm):	50
Hours/Day:	24.0
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 44 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 88 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

REM/Rate - Residential Energy Analysis and Rating Software v12.98

This information does not constitute any warranty of energy cost or savings.

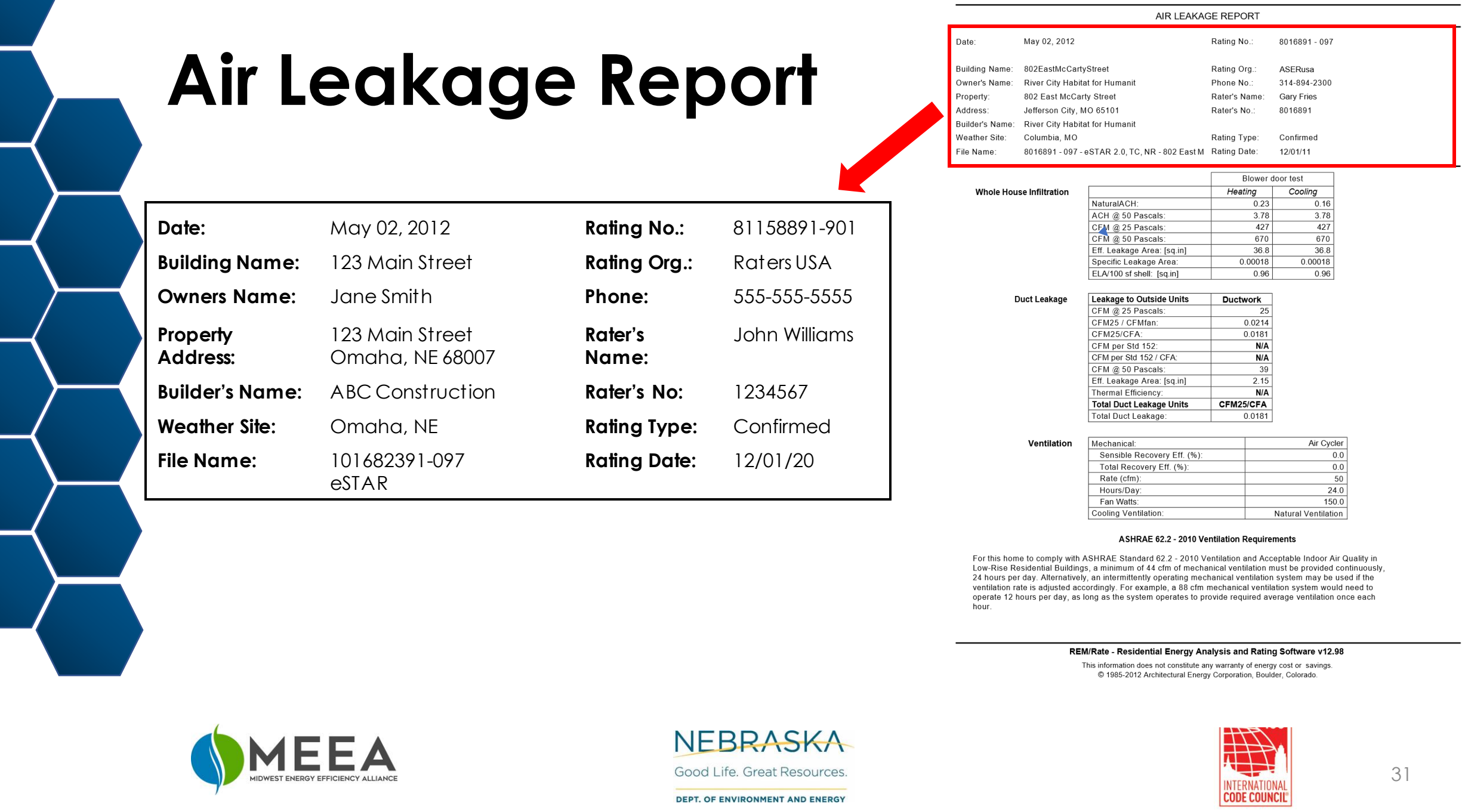
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

INTERNATIONAL CODE COUNCIL

Air Leakage Report

Date:	May 02, 2012	**Rating No.:**	81158891-901
Building Name:	123 Main Street	**Rating Org.:**	Raters USA
Owners Name:	Jane Smith	**Phone:**	555-555-5555
Property Address:	123 Main Street Omaha, NE 68007	**Rater's Name:**	John Williams
Builder's Name:	ABC Construction	**Rater's No:**	1234567
Weather Site:	Omaha, NE	**Rating Type:**	Confirmed
File Name:	101682391-097 eSTAR	**Rating Date:**	12/01/20



AIR LEAKAGE REPORT

Date:	May 02, 2012	Rating No.:	8016891 - 097
Building Name:	802EastMcCartyStreet	Rating Org.:	ASERusa
Owner's Name:	River City Habitat for Humanit	Phone No.:	314-894-2300
Property:	802 East McCarty Street	Rater's Name:	Gary Fries
Address:	Jefferson City, MO 65101	Rater's No.:	8016891
Builder's Name:	River City Habitat for Humanit		
Weather Site:	Columbia, MO	Rating Type:	Confirmed
File Name:	8016891 - 097 - eSTAR 2.0, TC, NR - 802 East M	Rating Date:	12/01/11

Whole House Infiltration

	Blower door test	
	Heating	*Cooling*
NaturalACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area: [sq.in]	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell: [sq.in]	0.96	0.96

Duct Leakage

Leakage to Outside Units	**Ductwork**
CFM @ 25 Pascals:	25
CFM25 / CFMfan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	**N/A**
CFM per Std 152 / CFA:	**N/A**
CFM @ 50 Pascals:	39
Eff. Leakage Area: [sq.in]	2.15
Thermal Efficiency:	**N/A**
Total Duct Leakage Units	**CFM25/CFA**
Total Duct Leakage:	0.0181

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff. (%):	0.0
Total Recovery Eff. (%):	0.0
Rate (cfm):	50
Hours/Day:	24.0
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 44 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 88 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

REM/Rate - Residential Energy Analysis and Rating Software v12.98

This information does not constitute any warranty of energy cost or savings.

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

INTERNATIONAL CODE COUNCIL

Air Leakage Report

Whole House Infiltration

	Blower Door Test	
	Heating	*Cooling*
Natural ACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area (sq. in)	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell (sq. in)	0.96	0.96

AIR LEAKAGE REPORT

Date:	May 02, 2012	Rating No.:	8016891 - 097
Building Name:	802EastMcCartyStreet	Rating Org.:	ASERusa
Owner's Name:	River City Habitat for Humanit	Phone No.:	314-894-2300
Property:	802 East McCarty Street	Rater's Name:	Gary Fries
Address:	Jefferson City, MO 65101	Rater's No.:	8016891
Builder's Name:	River City Habitat for Humanit		
Weather Site:	Columbia, MO	Rating Type:	Confirmed
File Name:	8016891 - 097 - eSTAR 2.0, TC, NR - 802 East M	Rating Date:	12/01/11

Whole House Infiltration

	Blower door test	
	Heating	*Cooling*
NaturalACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area: [sq.in]	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell: [sq.in]	0.96	0.96

Duct Leakage

Leakage to Outside Units	**Ductwork**
CFM @ 25 Pascals:	25
CFM25 / CFMfan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	**N/A**
CFM per Std 152 / CFA:	**N/A**
CFM @ 50 Pascals:	39
Eff. Leakage Area: [sq.in]	2.15
Thermal Efficiency:	**N/A**
Total Duct Leakage Units	**CFM25/CFA**
Total Duct Leakage:	0.0181

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff. (%):	0.0
Total Recovery Eff. (%):	0.0
Rate (cfm):	50
Hours/Day:	24.0
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 44 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 88 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

REM/Rate - Residential Energy Analysis and Rating Software v12.98

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

INTERNATIONAL CODE COUNCIL

Air Leakage Report

Duct Leakage

Leakage to Outside Units	Ductwork
CFM @ 25 Pascals:	25
CFM25/CFM fan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	N/A
CFM per Std 152/CFA:	N/A
CFM @ 50 Pascals:	39
Eff. Leakage Area (sq. in.)	2.15
Thermal Efficiency:	N/A
Total Duct Leakage Units:	**CFM25/CFA**
Total Duct Leakage:	0.0181

AIR LEAKAGE REPORT

Date:	May 02, 2012	Rating No.:	8016891 - 097
Building Name:	802EastMcCartyStreet	Rating Org.:	ASERusa
Owner's Name:	River City Habitat for Humanit	Phone No.:	314-894-2300
Property:	802 East McCarty Street	Rater's Name:	Gary Fries
Address:	Jefferson City, MO 65101	Rater's No.:	8016891
Builder's Name:	River City Habitat for Humanit		
Weather Site:	Columbia, MO	Rating Type:	Confirmed
File Name:	8016891 - 097 - eSTAR 2.0, TC, NR - 802 East M	Rating Date:	12/01/11

Whole House Infiltration

	Blower door test	
	Heating	*Cooling*
NaturalACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area: [sq.in]	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell: [sq.in]	0.96	0.96

Duct Leakage

Leakage to Outside Units	Ductwork
CFM @ 25 Pascals:	25
CFM25 / CFMfan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	**N/A**
CFM per Std 152 / CFA:	**N/A**
CFM @ 50 Pascals:	39
Eff. Leakage Area: [sq.in]	2.15
Thermal Efficiency:	**N/A**
Total Duct Leakage Units	**CFM25/CFA**
Total Duct Leakage:	0.0181

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff. (%):	0.0
Total Recovery Eff. (%):	0.0
Rate (cfm):	50
Hours/Day:	24.0
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 44 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 88 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

Air Leakage Report

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff (%):	0.0
Total Recovery Eff (%):	0.0
Rate (cfm):	50
Hours/Day:	24
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

AIR LEAKAGE REPORT

Date:	May 02, 2012	Rating No.:	8016891 - 097
Building Name:	802EastMcCartyStreet	Rating Org.:	ASERusa
Owner's Name:	River City Habitat for Humanit	Phone No.:	314-894-2300
Property:	802 East McCarty Street	Rater's Name:	Gary Fries
Address:	Jefferson City, MO 65101	Rater's No.:	8016891
Builder's Name:	River City Habitat for Humanit		
Weather Site:	Columbia, MO	Rating Type:	Confirmed
File Name:	8016891 - 097 - eSTAR 2.0, TC, NR - 802 East M	Rating Date:	12/01/11

Whole House Infiltration

	Blower door test	
	Heating	*Cooling*
NaturalACH:	0.23	0.16
ACH @ 50 Pascals:	3.78	3.78
CFM @ 25 Pascals:	427	427
CFM @ 50 Pascals:	670	670
Eff. Leakage Area: [sq.in]	36.8	36.8
Specific Leakage Area:	0.00018	0.00018
ELA/100 sf shell: [sq.in]	0.96	0.96

Duct Leakage

Leakage to Outside Units	**Ductwork**
CFM @ 25 Pascals:	25
CFM25 / CFMfan:	0.0214
CFM25/CFA:	0.0181
CFM per Std 152:	**N/A**
CFM per Std 152 / CFA:	**N/A**
CFM @ 50 Pascals:	39
Eff. Leakage Area: [sq.in]	2.15
Thermal Efficiency:	**N/A**
Total Duct Leakage Units	**CFM25/CFA**
Total Duct Leakage:	0.0181

Ventilation

Mechanical:	Air Cycler
Sensible Recovery Eff. (%):	0.0
Total Recovery Eff. (%):	0.0
Rate (cfm):	50
Hours/Day:	24.0
Fan Watts:	150.0
Cooling Ventilation:	Natural Ventilation

ASHRAE 62.2 - 2010 Ventilation Requirements

For this home to comply with ASHRAE Standard 62.2 - 2010 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, a minimum of 44 cfm of mechanical ventilation must be provided continuously, 24 hours per day. Alternatively, an intermittently operating mechanical ventilation system may be used if the ventilation rate is adjusted accordingly. For example, a 88 cfm mechanical ventilation system would need to operate 12 hours per day, as long as the system operates to provide required average ventilation once each hour.

REM/Rate - Residential Energy Analysis and Rating Software v12.98

Systems Commissioning and Completion Requirements

Section C408

- Commissioning is critical to ensure that buildings are **working as designed**
- Preliminary and final reports required
- Mechanical and lighting commissioning detailed in section C408

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Ventilation and I.A.Q.

Building Envelope +

Air Sealing Package +

HVAC Design, Equipment & Installation +

ERV/HRV +

Water Heating Design

= Occupant Comfort

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

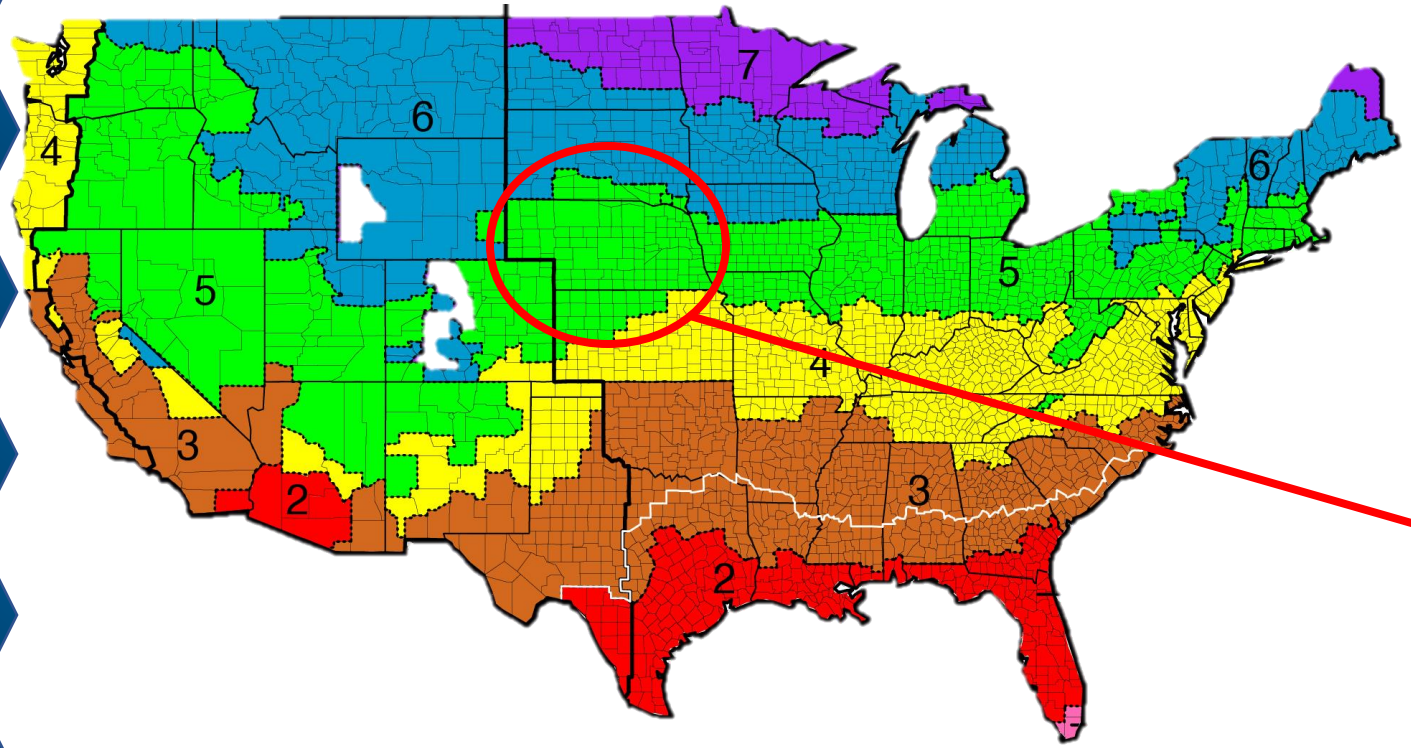
Moisture Management

It Connects EVERYTHING!

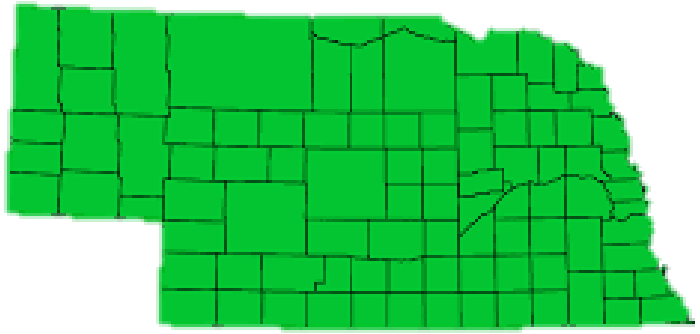
The Major "Damage Functions"

- Liquid water (bulk and capillary)
- Air-borne water
- Vapor
- Radiation (UV degradation)
- Pests
- People

Climate Zones



- Nebraska has only one climate zone – 5A
- Cold & Moist climate



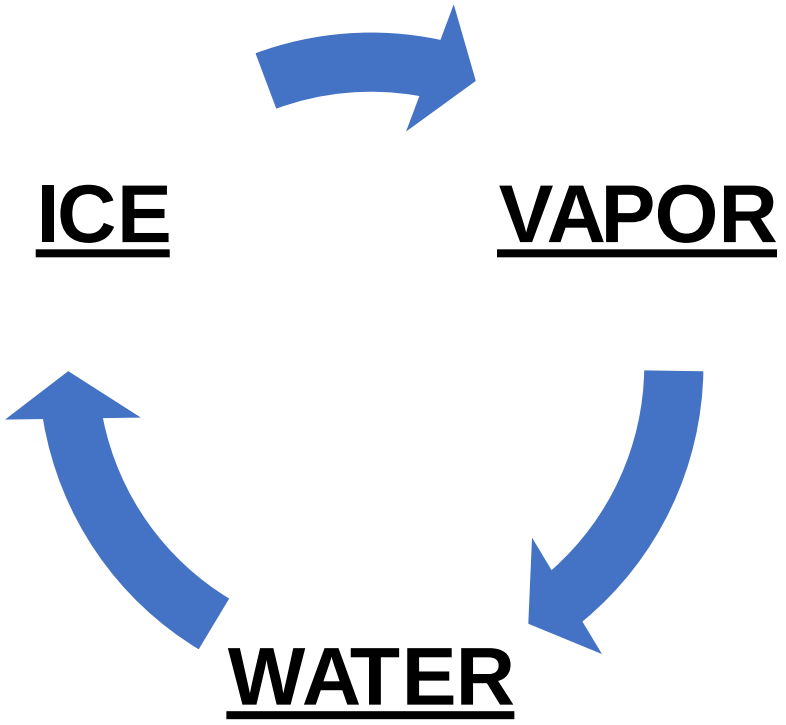
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

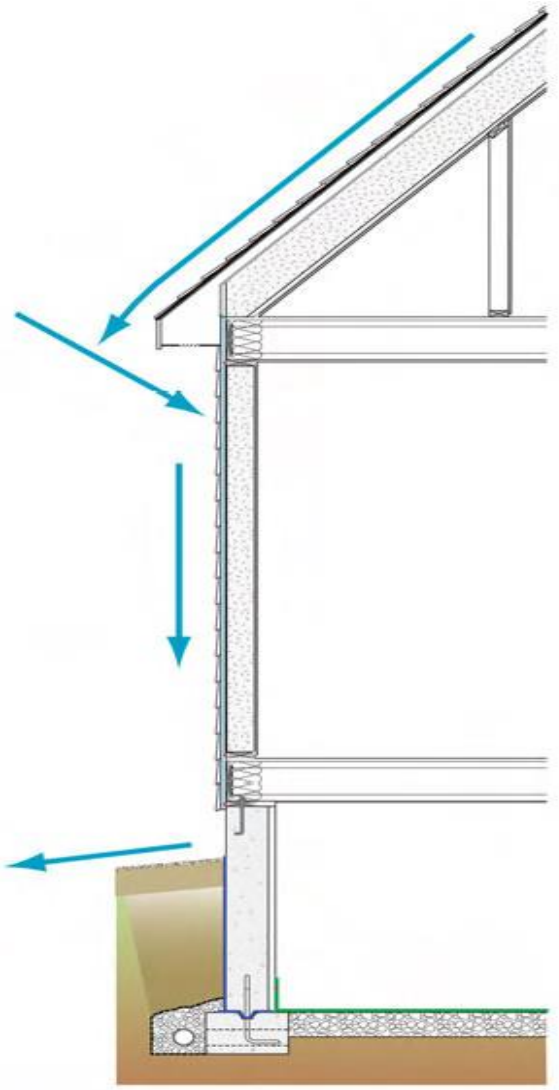
Prioritizing Moisture Movement

#1 – Bulk Water
#2 – Capillary Water
#3 – Air-Transported Moisture
#4 – Diffusive Moisture Movement



Bulk Water Management – Priority #1

The key is proper **drainage!**



MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

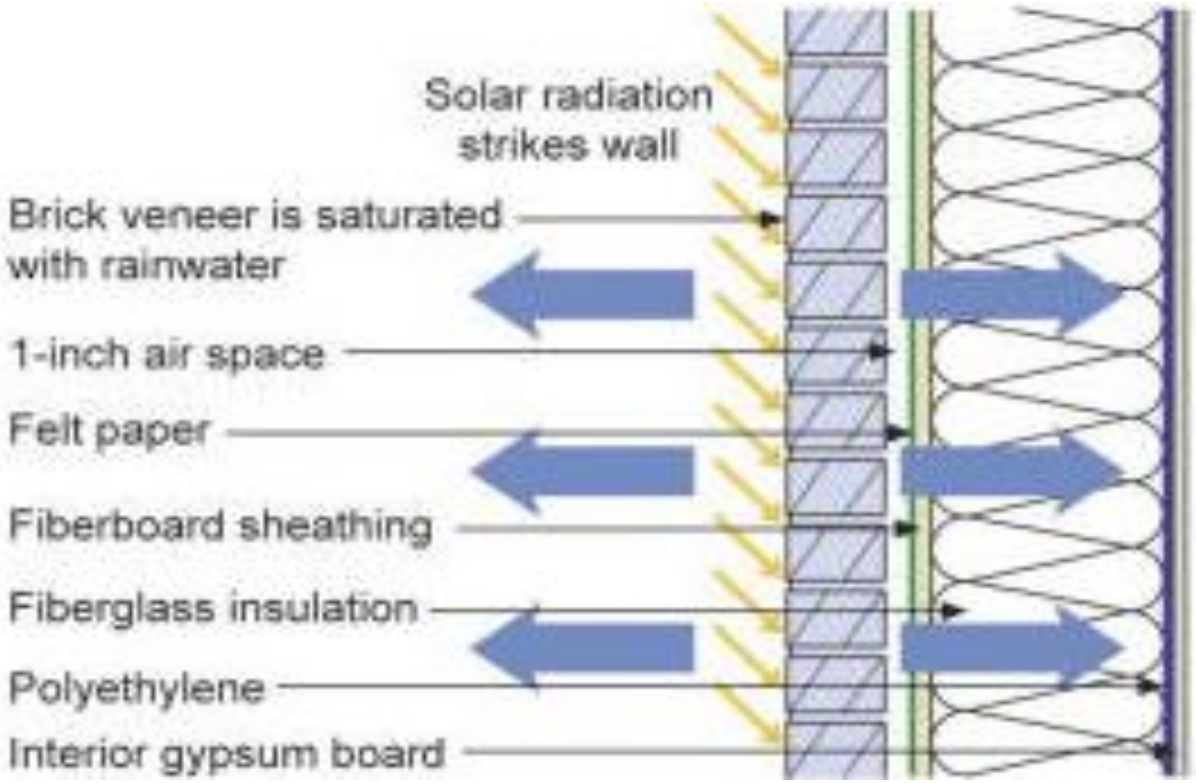
NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

Always Allow For Drying

Exterior Conditions
Temperature: 80° F
Relative Humidity: 75%
Vapor Pressure: 2.49 kPa

Conditions Within Cavity
Temperature: 120° F
Relative Humidity: 100%
Vapor Pressure: 11.74 kPa

Interior Conditions
Temperature: 75° F
Relative Humidity: 60%
Vapor Pressure: 1.82 kPa

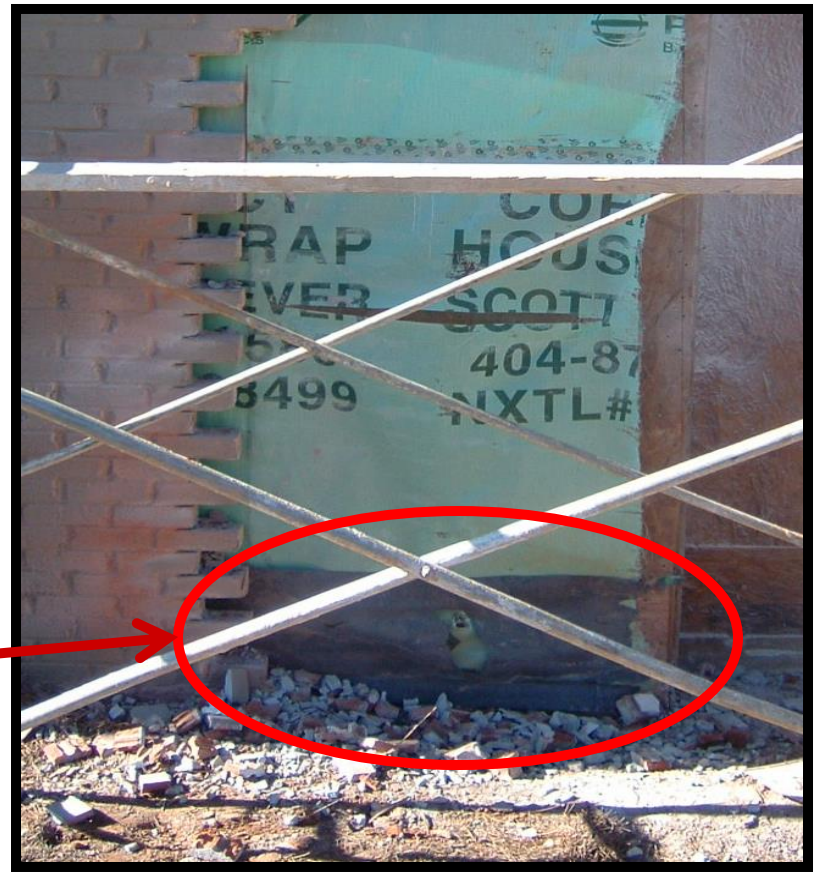


Vapor is driven both inward and outward by a high vapor pressure differential between the brick and interior and the brick and exterior

Image by Building Science Corp.

Properly Lap Flashing

- The mason's flashing (black) was installed after and in front of the house wrap (green). This is reverse flashing that will trap any drain water that gets past the brick veneer.



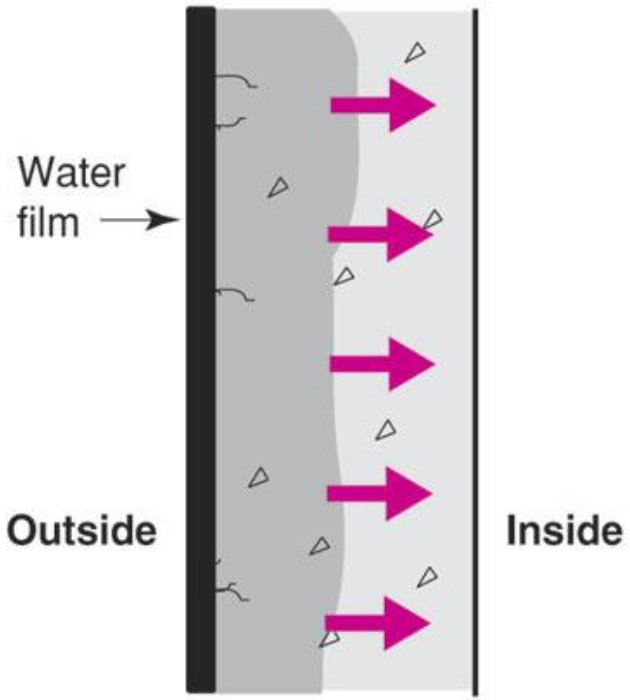
Direct Water Away From Corners

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

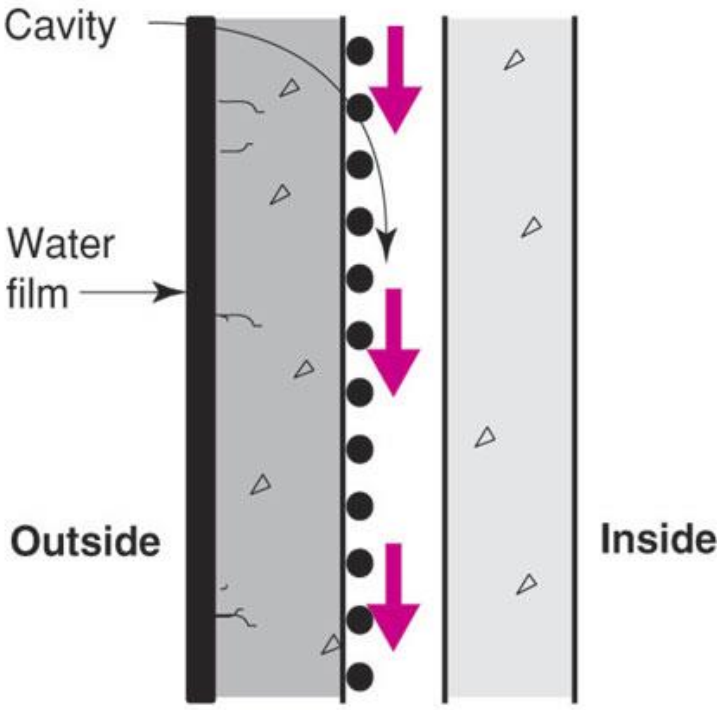
NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

ICC INTERNATIONAL CODE COUNCIL

Capillary Moisture Flows - Priority #2



Capillary suction draws water into porous material and tiny cracks



Cavity acts as capillary break and receptor for capillary water interrupting flow

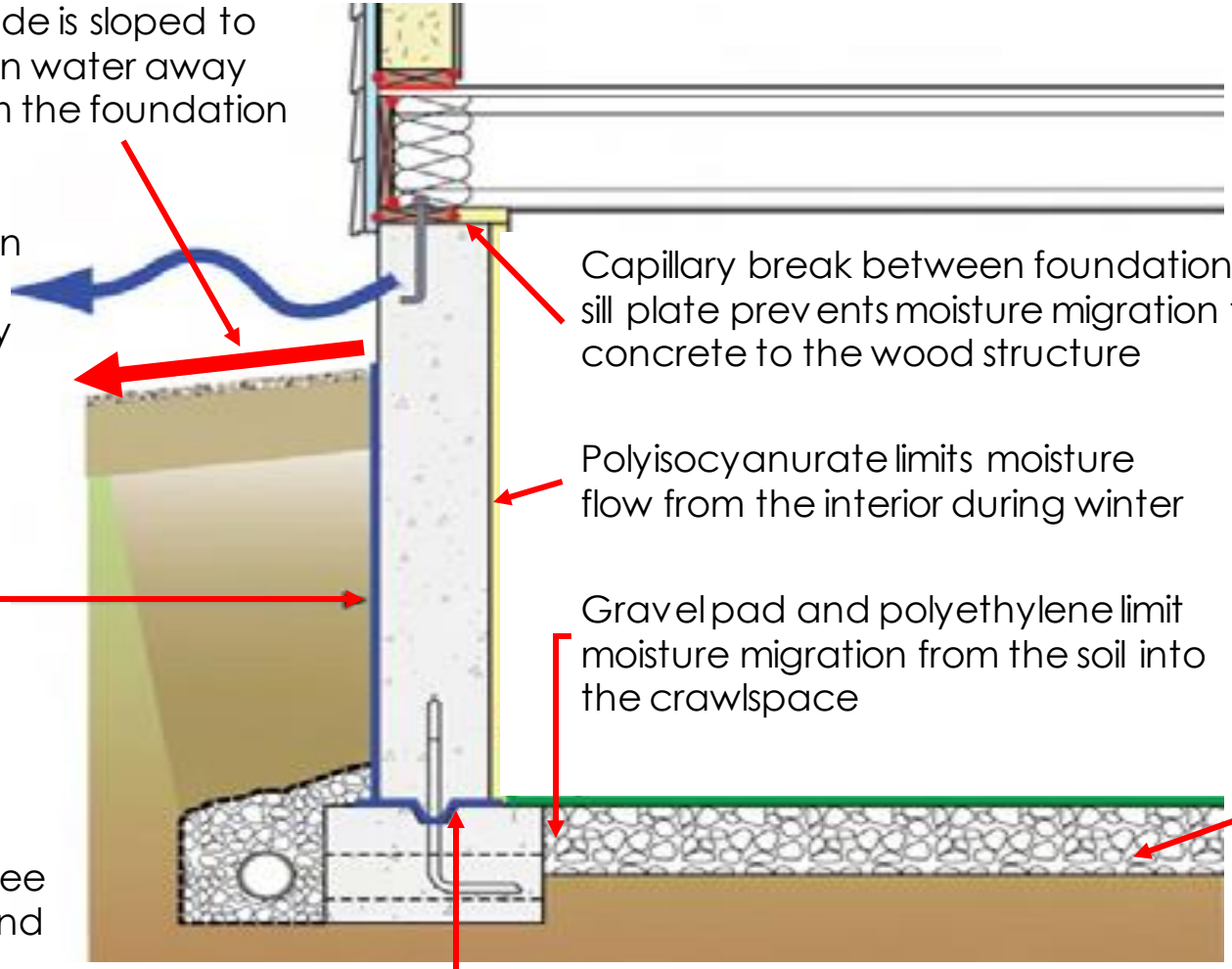
Image courtesy of Building Science Corp.

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Foundation Moisture Management



Grade is sloped to drain water away from the foundation

Exposed portion of foundation wall able to dry to exterior

Capillary break between foundation wall and sill plate prevents moisture migration from the concrete to the wood structure

Polyisocyanurate limits moisture flow from the interior during winter

Damp-proofing limits moisture flow from soil

Gravel pad and polyethylene limit moisture migration from the soil into the crawlspace

Gravel pad is connected to the perimeter drain through pipes cast into the footing

Water against the foundation wall drains down the free draining backfill and out the perimeter drain at the footing

Capillary break between footing and foundation wall

Sill Plates Need Capillary Breaks

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Air Transport of Moisture – Priority #3

- Air carries a ***lot*** of water
- Air leakage
  - Moisture flow
    - 4X8 Drywall
    - 70 F
    - 40% RH
    - 1 square inch hole
- Flow quantity
  - 30 Quarts of water!!

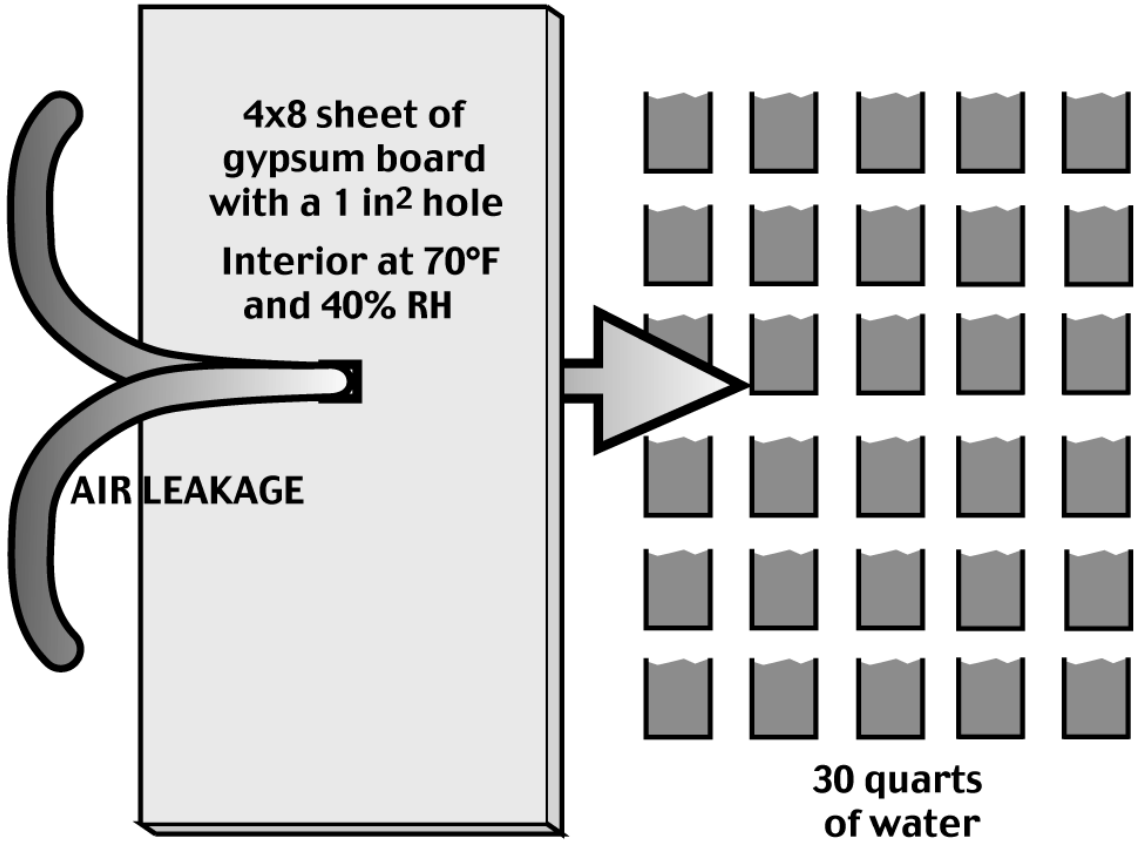


Image courtesy of Building Science Corp.

Diffusion – Priority #4

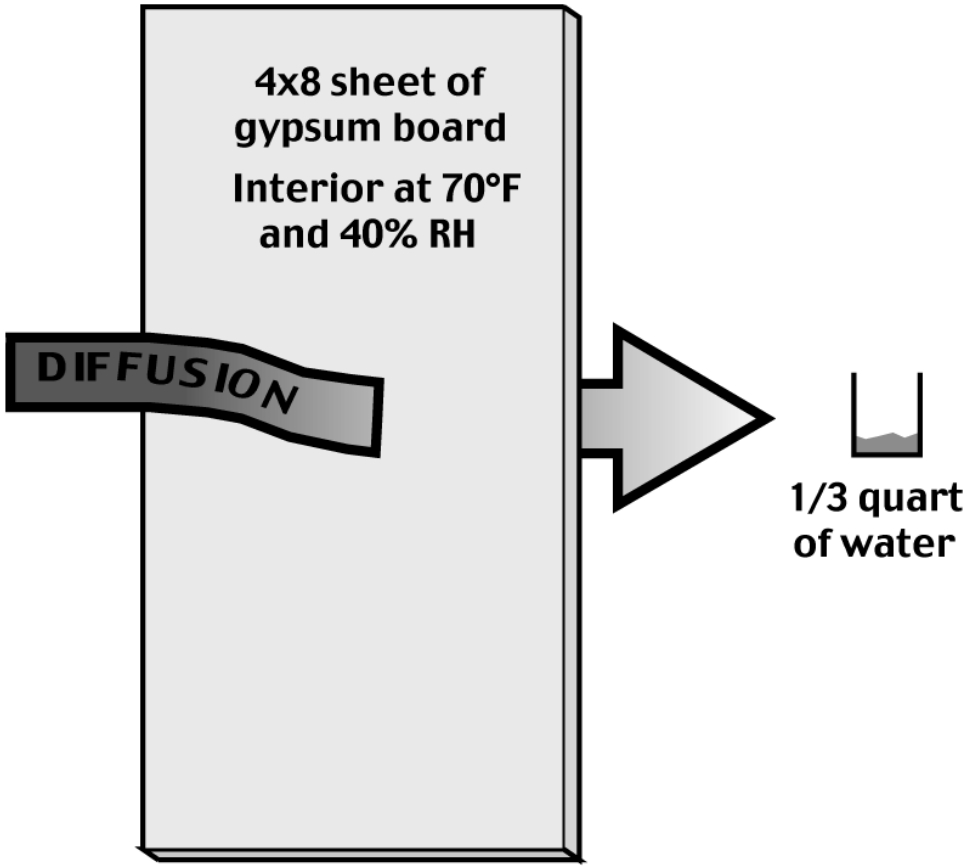


Image courtesy of Building Science Corp.

- Migration of moisture by means of vapor pressure differential
- Occurs in either direction based on climate conditions and exterior/interior levels of humidity
- Different building materials have different permeability

Air Movement

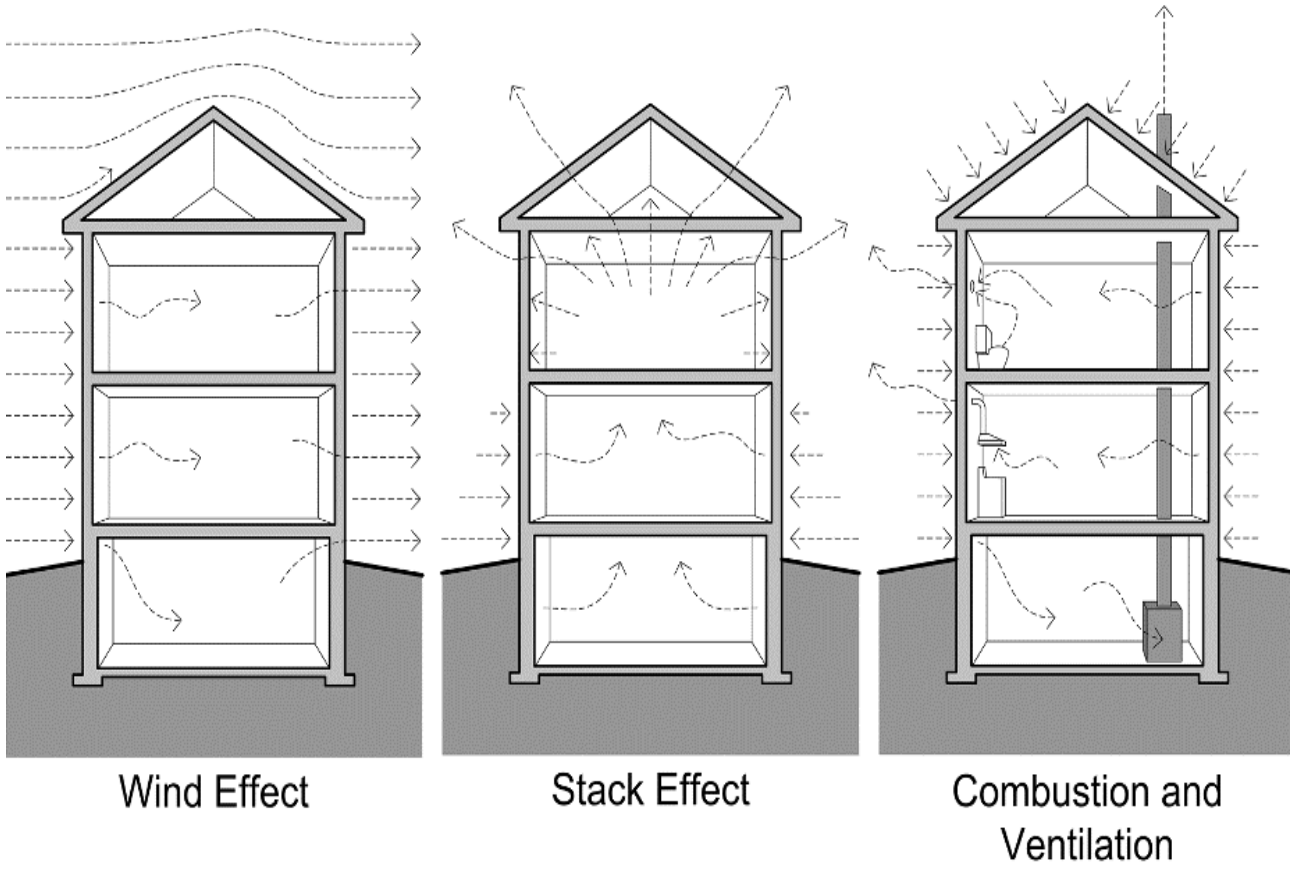
Air Movement Seeks Balance

How Does Air Get Around?

Air In = Air Out

For air movement you need:

- A hole
- A driving force
- Another hole



Internally Generated Air Pressure

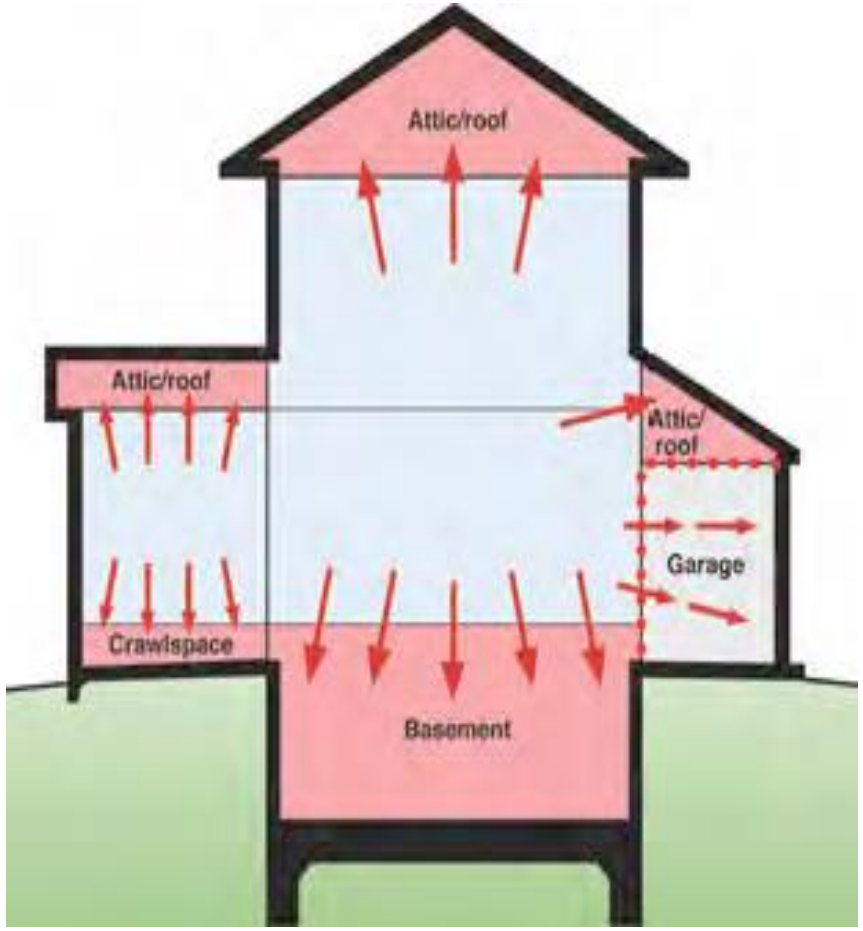


Image by Belcher Homes

Expansion of Conditioned Space

- Conditioned space boundaries moving towards exterior surfaces of building
- Garage isolated from house by air barrier/pressure boundary
- Garage ventilated and conditioned independently of rest of conditioned spaces

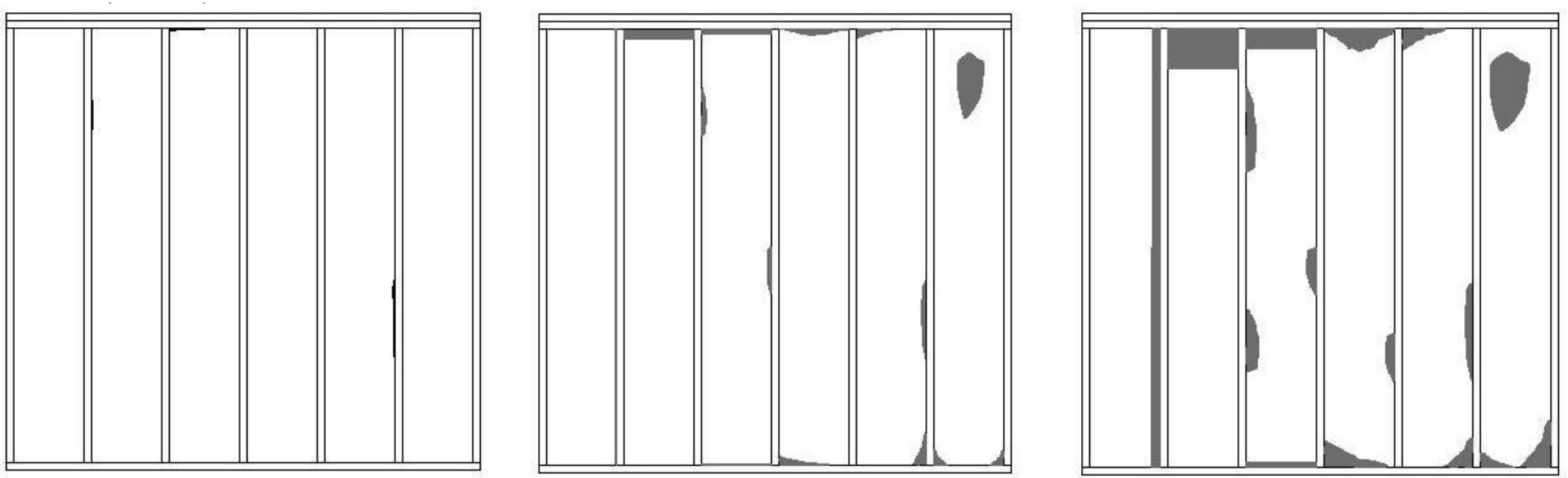
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Batt Insulation Grading

Code Compliant ——— **Not Acceptable** ———



Grade I: Almost no gaps

Grade II: Up to 2%

Grade III: 2% - 5%

RESNET protocol for the effect of missing insulation on installation grade

Diagrams from the HERS Standards

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

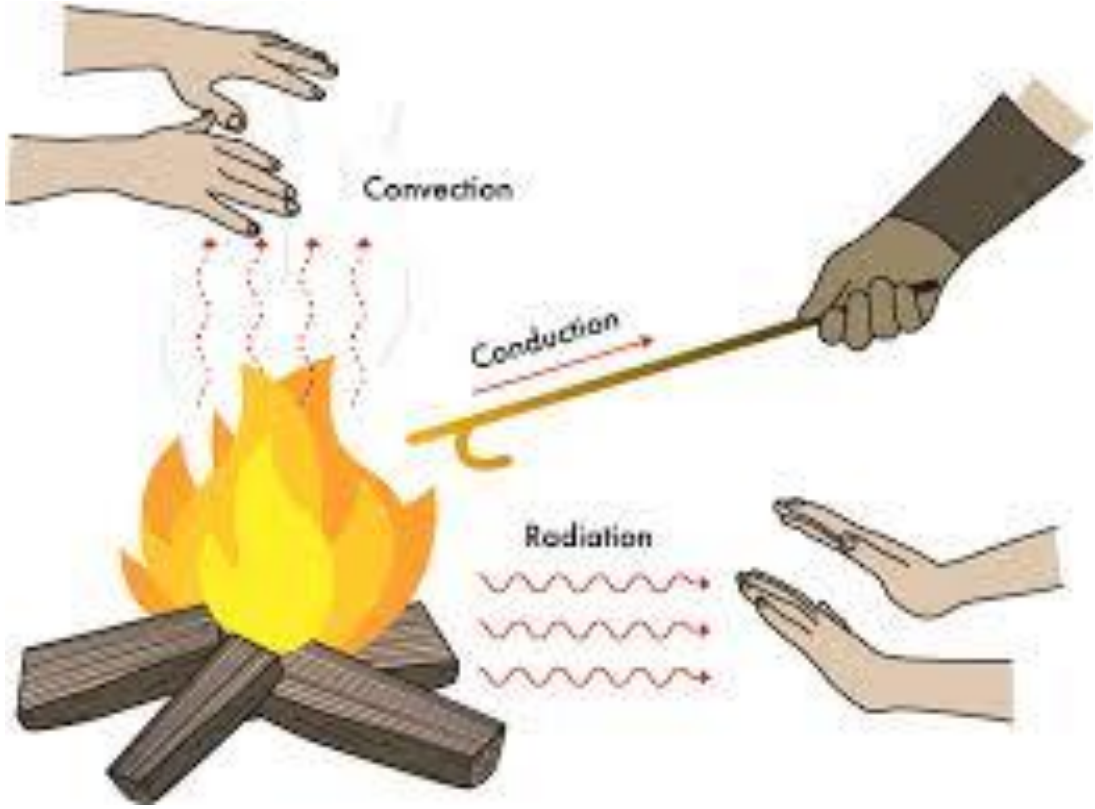
INTERNATIONAL CODE COUNCIL

Heat Transfer

A Triple Threat

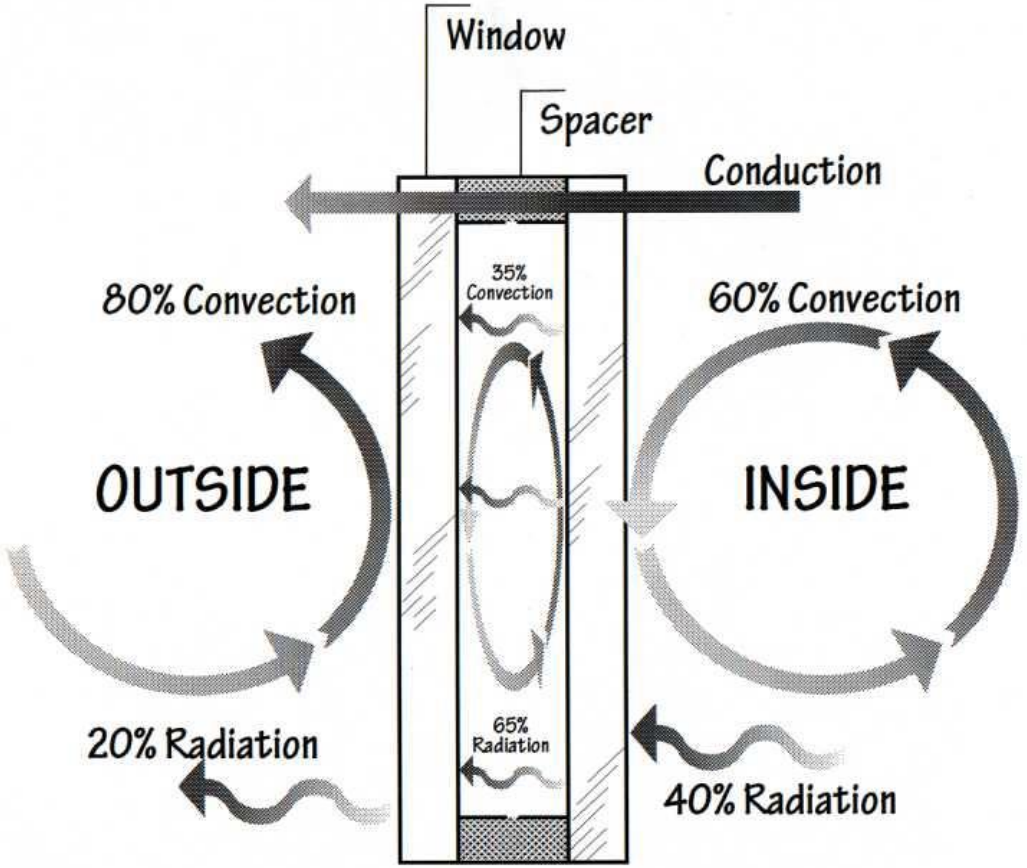
Heat Transfers in 3 Ways

- ***Convection*** - Through fluids (liquid or gas)
- ***Conduction*** - Through solids
- ***Radiation*** - Mostly windows



Practical Application - Windows

- Heat always moves from hot to cold
- Always a mix of transfers
- Different rates of transfer can be important



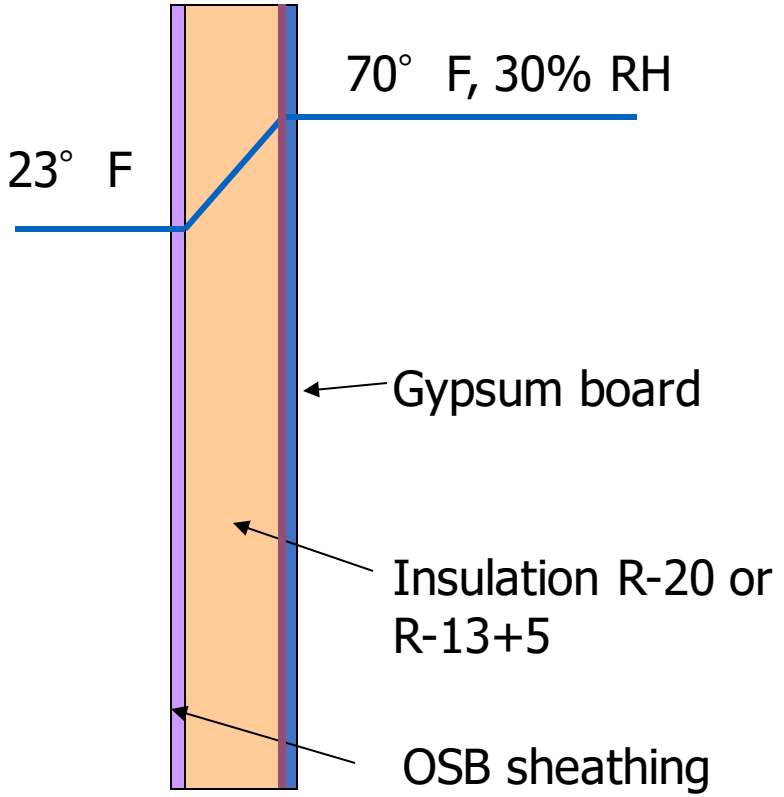
MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Condensing Surface Temperatures

- Dewpoint of interior air = 37°F
- Where will condensation occur?
  Inside surface of exterior sheathing
- One Solution?
  Interior vapor retarder, but what type and at what "cost?"



MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Major Building Envelope Protection Systems

- Water Barrier
- Air Barrier
- Thermal Barrier
- Vapor Profile (not just the designated vapor retarder)
- Maintenance documents

“You don’t get what you expect, you get what you inspect!”

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

HVAC System

*Don't Forget the **"V"***

HVAC Design and Loads

Oversized systems:

- Less comfort
- Less efficient
- Poorly handles moisture
- Premature equipment failure

Right-sized systems:

- Better operating efficiencies
- Greater comfort
- Healthier indoor environments
- Better moisture control

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

HVAC Design and Loads

- Properly designed HVAC systems rely on scientific criteria and a systematic method to match the loads required for health and comfort:
  - *ACCA Manual J – Residential Load Calculation*
  - *ACCA Manual S – Residential Equipment Selection*
  - *ACCA Manual D – Residential Duct Systems*
- Reports should be submitted with permit application

ACCA®
Air Conditioning Contractors of America

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL®

HVAC Load Calculations - Commercial
Section C403.1.1 (Mandatory)

Heating and cooling load sizing calculations required:

- ASHRAE/ACCA Standard 183

- OR -

- Other approved computation procedures – defined in Chapter 3
  - Interior design conditions specified by Section C302
    - ≤ 72°F for heating load
    - ≥ 75°F for cooling load
- Loads reduced from energy recovery systems utilized in the HVAC system shall be accounted for in accordance with the ASHRAE HVAC Systems and Equipment Handbook

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

HVAC Design and Loads

Today's homes risk health problems for occupants because:

- They are not properly ventilated:
  - < 3 ACH
- More chemicals and products are used in and around a house:
  - Concentration levels are often 2 to100 times higher than outside.

Balanced Ventilation

- Blows air into and out of the house
- Is cost effective by reclaiming energy from exhaust and supply airflows (60%-80%!)
- Balances exhaust and supply flows (minimizes pressure differential)
- Maintains the Minimum Ventilation Guideline automatically with proper set-up

Appraisals and Resale Value

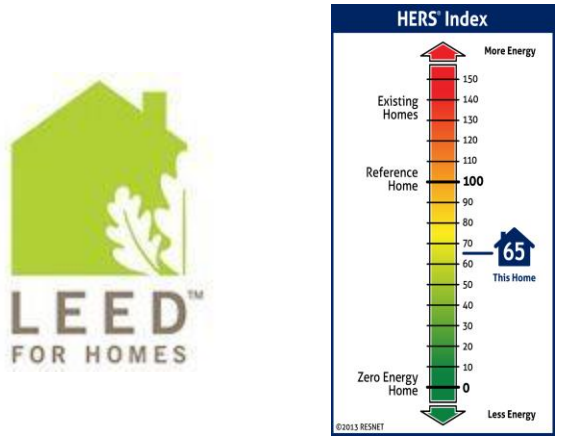
MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

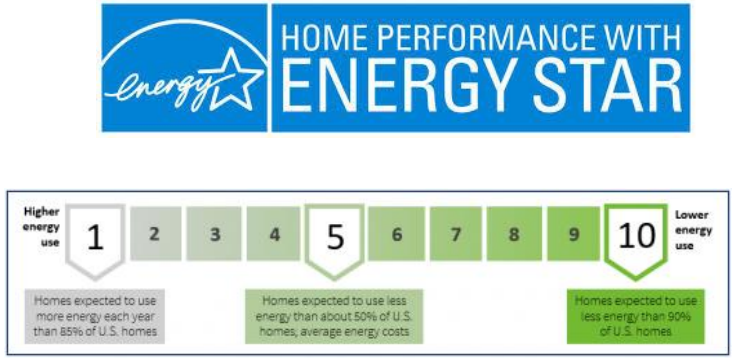
NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Appraisers

- Unlike granite countertops, energy efficiency investments are not always visible at a glance
- Utilize certifications, labels, ratings, and scores
- Make sure appraisers are accurately valuing sustainable properties
  - *Residential Green and Energy Efficient Addendum* - Assists appraisers in analyzing residential "Green" features and properties.

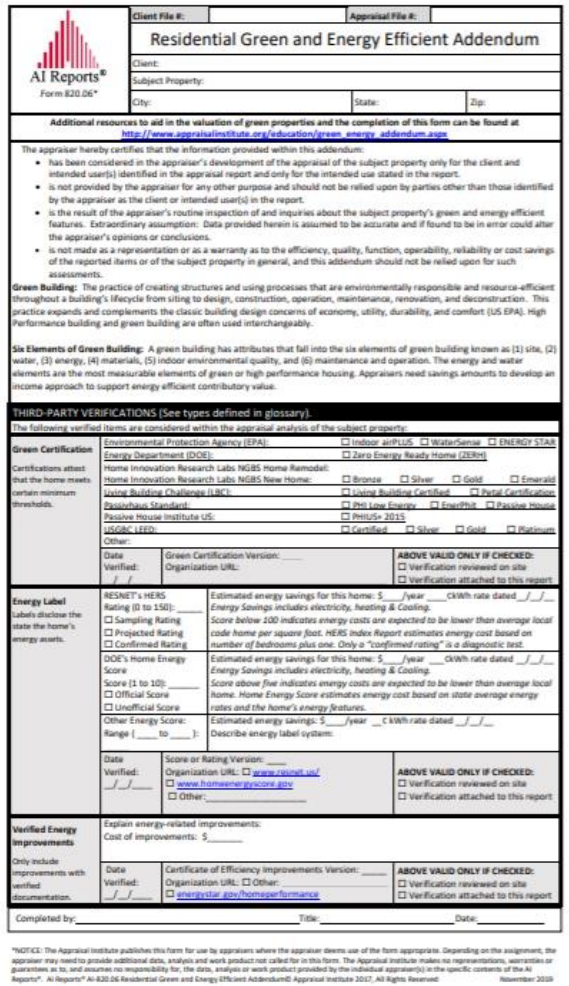




Residential Green and Energy Efficient Addendum!

- Resources for realtors and appraisers on properly valuing energy efficiency/green features
  - Educational materials
  - List of designated appraisers
  - Trainings

- For more information: http://www.appraisalinstitute.org/education/green_energy_addendum.aspx



AI Reports®
Form 820.06*

Residential Green and Energy Efficient Addendum

Client File #: | Appraisal File #:

Client:

Subject Property:

City: | State: | Zip:

Additional resources to aid in the valuation of green properties and the completion of this form can be found at http://www.appraisalinstitute.org/education/green_energy_addendum.aspx

The appraiser hereby certifies that the information provided within this addendum:

- has been considered in the appraiser's development of the appraisal of the subject property only for the client and intended user(s) identified in the appraisal report and only for the intended use stated in the report.
- is not provided by the appraiser for any other purpose and should not be relied upon by parties other than those identified by the appraiser as the client or intended user(s) in the report.
- is the result of the appraiser's routine inspection of and inquiries about the subject property's green and energy efficient features. Extraordinary assumption: Data provided herein is assumed to be accurate and if found to be in error could alter the appraiser's opinions or conclusions.
- is not made as a representation or as a warranty as to the efficiency, quality, function, operability, reliability or cost savings of the reported items or of the subject property in general, and this addendum should not be relied upon for such assessments.

Green Building: The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's lifecycle from siting to design, construction, operation, maintenance, renovation, and deconstruction. This practice expands and complements the classic building design concerns of economy, utility, durability, and comfort (US EPA). High Performance building and green building are often used interchangeably.

Six Elements of Green Building: A green building has attributes that fall into the six elements of green building known as (1) site, (2) water, (3) energy, (4) materials, (5) indoor environmental quality, and (6) maintenance and operation. The energy and water elements are the most measurable elements of green or high performance housing. Appraisers need savings amounts to develop an income approach to support energy efficient contributory value.

THIRD-PARTY VERIFICATIONS (See types defined in glossary).

The following verified items are considered within the appraisal analysis of the subject property:

Green Certification — Certifications attest that the home meets certain minimum thresholds.

- Environmental Protection Agency (EPA): ☐ Indoor airPLUS ☐ WaterSense ☐ ENERGY STAR
- Energy Department (DOE): ☐ Zero Energy Ready Home (ZERH)
- Home Innovation Research Labs NGBS Home Remodel:
- Home Innovation Research Labs NGBS New Home: ☐ Bronze ☐ Silver ☐ Gold ☐ Emerald
- Living Building Challenge (LBC): ☐ Living Building Certified ☐ Petal Certification
- Passivhaus Standard: ☐ PHI Low Energy ☐ EnerPHit ☐ Passive House
- Passive House Institute US: ☐ PHIUS+ 2015
- USGBC LEED: ☐ Certified ☐ Silver ☐ Gold ☐ Platinum
- Other:

Date Verified: / / | Green Certification Version: ____ Organization URL: | ABOVE VALID ONLY IF CHECKED: ☐ Verification reviewed on site ☐ Verification attached to this report

Energy Label — Labels disclose the state the home's energy assets.

- RESNET's HERS Rating (0 to 150): ____ ☐ Sampling Rating ☐ Projected Rating ☐ Confirmed Rating — Estimated energy savings for this home: $____/year ____ckWh rate dated __/__/__. *Energy Savings includes electricity, heating & Cooling. Score below 100 indicates energy costs are expected to be lower than average local code home per square foot. HERS Index Report estimates energy cost based on number of bedrooms plus one. Only a "confirmed rating" is a diagnostic test.*
- DOE's Home Energy Score Score (1 to 10): ____ ☐ Official Score ☐ Unofficial Score — Estimated energy savings for this home: $____/year ____ckWh rate dated __/__/__. *Energy Savings includes electricity, heating & Cooling. Score above five indicates energy costs are expected to be lower than average local home. Home Energy Score estimates energy cost based on state average energy rates and the home's energy features.*
- Other Energy Score: Range (____ to ____): — Estimated energy savings: $____/year ____ckWh rate dated __/__/__ Describe energy label system:

Date Verified: __/__/____ | Score or Rating Version: ____ Organization URL: ☐ www.resnet.us/ ☐ www.homeenergyscore.gov ☐ Other:_____ | ABOVE VALID ONLY IF CHECKED: ☐ Verification reviewed on site ☐ Verification attached to this report

Verified Energy Improvements — Only include improvements with verified documentation.

Explain energy-related improvements.
Cost of improvements: $_____

Date Verified: __/__/____ | Certificate of Efficiency Improvements Version: ____ Organization URL: ☐ Other: ☐ energystar.gov/homeperformance | ABOVE VALID ONLY IF CHECKED: ☐ Verification reviewed on site ☐ Verification attached to this report

Completed by:_____ Title:_____ Date:_____

*NOTICE: The Appraisal Institute publishes this form for use by appraisers where the appraiser deems use of the form appropriate. Depending on the assignment, the appraiser may need to provide additional data, analysis and work product not called for in this form. The Appraisal Institute makes no representations, warranties or guarantees as to, and assumes no responsibility for, the data, analysis or work product provided by the individual appraiser(s) in the specific contents of the AI Reports®. AI Reports® AI-820.06 Residential Green and Energy Efficient Addendum® Appraisal Institute 2017. All Rights Reserved. November 2019

Form 820.04

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

ICC
INTERNATIONAL CODE COUNCIL®

Lender Specification

"This Home/Building is being built/renovated/updated to nationally recognized standards above prevailing code. It is designed and constructed with unique features and materials and with high efficient equipment and in accordance with high efficiency standards. The Lender shall choose an Appraiser educated and knowledgeable in this type of valuation of these specialized Homes, preferably an appraiser who holds a professional appraisal designation that requires advanced education on such issues as the valuation of sustainable buildings (e.g. MAI or SRA designations from the Appraisal Institute). The appraiser shall provide verification of green valuation education of 14 hours or more from a qualified educational provider and knowledge to be permitted to conduct the appraisal for this project."

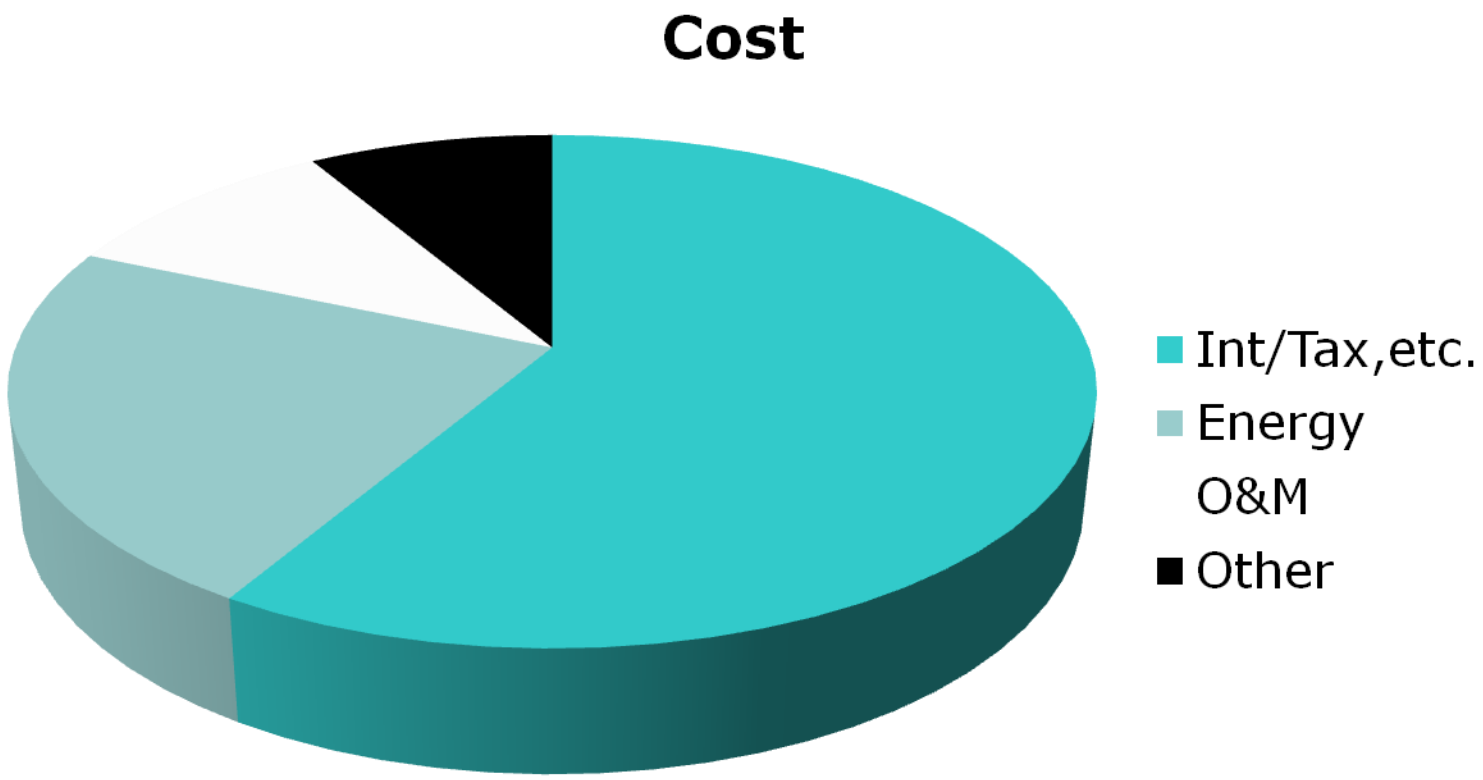
Marketing High Performance

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL®

Equity!



Monthly Payment

Existing Buildings
Section C503 - Alterations

- Code applies to any new construction
  - Additions or new work in existing structures
- Unaltered portion(s) may not need to comply
- When complying via ASHRAE 90.1-2016, alterations do not need to comply with C402-C405
- Where existing building exceeds fenestration area limitations of Section C402.4.1 prior to alteration, building is exempt from C402.4.1 provided there is no increase in fenestration area

Image: montgomerycountymd.gov

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Key Takeaways

- 2018 IECC has new requirements for:
  - Air sealing
  - Duct sealing
  - U-Factor
  - R-Values
  - Performance Testing
- Controlling moisture is *critical*
  - Proper air sealing is key
  - Right-sizing HVAC is required
  - Mechanical ventilation must be installed and takes on new importance

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Looking Ahead:

- IECC changes to The National Energy Standard as of 2024.
- Uses 2021 IECC as a baseline.
- Introduces Carbon Impact into the conversation.
- On a trajectory for Net Zero Energy as of 2030.

MEEA MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA Good Life. Great Resources. DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION ICC INTERNATIONAL CODE COUNCIL

Upcoming Events

November 8 12pm-1:30pm – Comparing IECC/IBC/IRC: Discussing the 2021 & 2024 Energy Codes and Standards

December TBD – Training on Multifamily Buildings and Mixed-Use, IECC and ASHRAE

Winter 2024 - Online MCC Energy Code Certificate 4-Week Course: Foundations for Residential and Commercial Energy Code Compliance in Nebraska

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL

Thank You!

Matt Belcher
Verdatek Solutions
Matt@verda-solutions.com
314.749.4189

John Gossman
Midwest Energy Efficiency Alliance
jgossman@mwalliance.org
312.374.0955

https://www.mwalliance.org/nebraska-energy-codes-training-program

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE

NEBRASKA
Good Life. Great Resources.
DEPT. OF ENVIRONMENT AND ENERGY

NEBRASKA CODE OFFICIALS ASSOCIATION
ICC
INTERNATIONAL CODE COUNCIL