



# Don't Stop at Code – The Incremental Value of a HERS Rating

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# Question 1

What value does a HERS Rating bring to a building project?

## Question 2

What is value?



# Answer 2

Merriam-Webster says:

<sup>1</sup>value 

*noun* | val·ue | \ˈval-(,)yü\

## Simple Definition of VALUE

Popularity:

- : the amount of money that something is worth : the price or cost of something
- : something that can be bought for a low or fair price
- : usefulness or importance

# Answer 1

It depends.

What we think isn't the most  
important.

It's all about the customer, dummy.

# How do we create value?

- ▶ What do our customers want?
  - Save money
  - Innovation
  - Differentiation
  - Increased sales

# How do we create value?

- ▶ What do our customers need?
  - Less pain
  - Better understanding
  - Less Risk



# How do we create value?



- ▶ Mitigate risk
- ▶ Help your customer to understand the advantage of being at the summit.



# Who is in the room?

- ▶ Let's look at a few perspectives about value:
  - Builders
  - Trades
  - Manufacturers
  - Design Professionals
  - Energy Professionals

# Builders

- ▶ Those who know the rules and can identify and manage those who have the skills can build homes with lower cost and lower risk.
  - Level of performance
    - Not compliant – not an option, but ...
    - At compliance –least cost path must include all steps
    - Above compliance
  - Need to identify those with the right skills



# Trades

- ▶ Those who know the rules and have the skills can do the work at lower cost **and** at the lower risk.
  - Must identify and obtain skills
    - Certifications
    - Reputation
  - Live by 1-10-100 rule
    - Problem solvers





# Manufacturers

## ▶ Manufacturers:

- Some of the solutions will come from innovation, presenting opportunities for manufacturers who develop solutions that solve builders' problems.
- Product support is key





# Design Professionals

- ▶ Design Professionals:
  - Those who know the rules and have the skills can do the work lower cost **and** lower risk.
    - 1-10-100 rule applies on paper as well
      - Team approach
      - Design development
    - Certifications/Reputation
    - Innovation vs. Risk Aversion



# Energy Professionals

- ▶ Energy Professionals:
  - Level of participation is also an option
    - Ability to participate at higher levels adds value
    - Can help others with 1/10/100 rule
    - Independence
    - Advocacy (for customer)



# HERS Rater

- ▶ Which of these skills have value to your customers
  - Technician with the right tools (BD/DB/Visual Verification)
  - Consultant/Expert
  - Understanding of the codes and standards
  - HVAC Systems
    - Manual J, D, S
    - Ventilation
  - Education/Training

# Ventilation Example

- ▶ Ventilation options/requirements (SF)
  - Consultant/Expert - Codes and Standards
  - HVAC Systems - Ventilation
  - Education/Training
  - Technician



# Ventilation Example

- Consultant/Expert - Codes and Standards
  - 2009 IRC – Natural ventilation unless operable openings  $< 4\%$  of habitable rooms
  - 2012/2015 IRC – Whole house mechanical ventilation if  $ACH_{50} < 5$

# Ventilation Example

- Options: exhaust, supply, balanced 2009-2015 IRC
- Controls:
  - 2009 IRC – not specified
  - 2012/2015 - Continuous/programmed intermittent with manual override:
- How Much:
  - 2009 IRC - 0.35 ACH (can be applied to a portion) or 15 cfm/occupant whole house
  - 2012/2015 IRC – per table

# Ventilation Example

TABLE M1507.3.3(1)  
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0 – 1	2 – 3	4 – 5	6 – 7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot = 0.0929 m<sup>2</sup>, 1 cubic foot per minute = 0.0004719 m<sup>3</sup>/s.

TABLE M1507.3.3(2)  
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS<sup>a, b</sup>

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor <sup>a</sup>	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.

b. Extrapolation beyond the table is prohibited.

# Ventilation Example

- ▶ Ventilation options/requirements (IRC)
  - Education/Training
    - How do you get this done without some ability to educate and train?
  - Technician
    - This all needs to be verified and possibly tested, right?



# Code Compliance v HERS Rating



Compliance Documentation



**Maybe** Insulation/Air Sealing Verification



Air Leakage Testing



Duct Leakage Testing



HVAC System Verification



**Pass/Fail**

Feedback

**HERS Index+**



Education/Training



Cost



# Specific Opportunities

## ▶ Educate

- Code official groups at regular meetings
  - Leads to referrals
  - Better relationships on the job – provides value to clients
- Trades subject to compliance
  - Insulators
  - HVAC contractors
  - In the field

# Specific Opportunities

- ▶ Bundle services
  - Compliance calculations and documentation
  - Field verification services
  - Design verification services
  - Can be a great 1/10/100 tool
  - Helps to control cost
- ▶ A HERS Rating is not a bad way of accomplishing all of this

# Specific Opportunities

- ▶ Create partnerships
  - Architects/engineers and verifiers
  - Trades and verifiers – watch conflicts
- ▶ Build relationships
  - Understand what definition of value client uses
  - Problem solver (1/10/100 rule)



# The Perfect Storm



# Perfect Storm—The Setting

MaGrann Associates





# Perfect Storm–The Phone Call Diagnosis

## ► Symptoms

- Cold in winter- particularly over garage
- Hot in summer – particularly in 3<sup>rd</sup> floor units
- Problems with HVAC systems not working

## ► What Happened?



# Perfect Storm - Duct Problems





# Perfect Storm– Floor Over Garage

Insulation on garage ceiling open to porch and in contact with the wrong surface



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Gaps between floor system and vented soffit at perimeter



# Perfect Storm – HVAC System



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- ▶ Furnaces sized at over 300% of design heating load
- ▶ Furnace temperature rise in excess of 100F in several homes
- ▶ 3 ½ ton AC systems 1 to 1 ½ ton oversized.
- ▶ Cooling airflow as low as 260 CFM/ton (should be 400) = coil freeze
- ▶ Duct leakage as high as 40% supply and 60% return
- ▶ Pressurized Bedrooms – sucking and blowing



# Perfect Storm - Solutions

- ▶ First convince the builder that you have the answer
- ▶ Convince a room of 75 owners that you are not insane
- ▶ Remedial action involved HVAC equipment, thermal envelope and duct systems
  - Downsize heating and cooling equipment
  - Remove much of the ceiling in several garages in each building to repair insulation and draftblocking
  - Seal duct systems, install transfer grilles, fix flex ducts
- ▶ All three areas had to be addressed to improve performance due to “house as system” relationships

# Final Quiz







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# Questions?



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