

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

Doug McCleery, PE, CEM

February 29, 2016



Question 1

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



Question 2

What is value?



Answer 2

Merriam-Webster says:



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

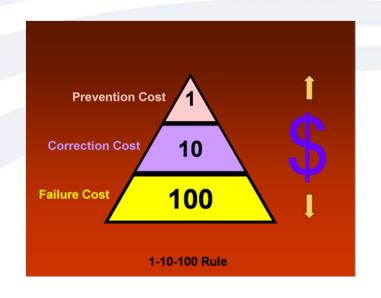


How do we create value?

- ► What do our customers <u>need</u>?
 - 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 <u>can</u> build homes with lower cost <u>and</u> 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 <u>can</u> 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 options/requirements (SF)
 - Consultant/Expert Codes and Standards
 - HVAC Systems Ventilation
 - Education/Training
 - Technician



- Consultant/Expert Codes and Standards
 - 2009 IRC Natural ventilation unless operable openings <4% of habitable rooms
 - 2012/2015 IRC Whole house mechanical ventilation if ACH50 < 5



- 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



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

DWELLING UNIT	NUMBER OF BEDROOMS							
FLOOR AREA (square feet)	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^2 , 1 cubic foot per minute = $0.0004719 \text{ m}^3/\text{s}$.

TABLE M1507.3.3(2) INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS^{a, b}

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	25%	33%	50%	66%	75%	100%
Factor ^a	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 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





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



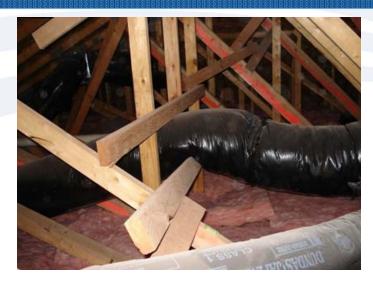
Perfect Storm-The Phone Call Diagnosis

- Symptoms
 - Cold in winter- particularly over garage
 - Hot in summer particularly in 3rd floor units
 - Problems with HVAC systems not working
- ► What Happened?

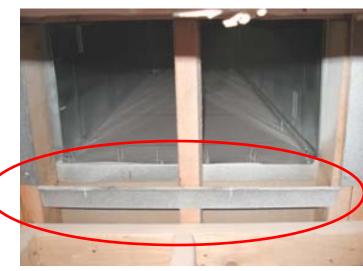


Perfect Storm - Duct Problems









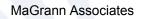


Perfect Storm-Floor Over Garage

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



Gaps between floor system and vented soffit at perimeter





Perfect Storm – HVAC System



MaGrann Associates

- 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







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

Doug McCleery, PE, CEM

February 29, 2016



Questions?



Douglas McCleery, P.E., CEM
VP Technical Services
MaGrann Associates
856-813-8758
dougmccleery@magrann.com

