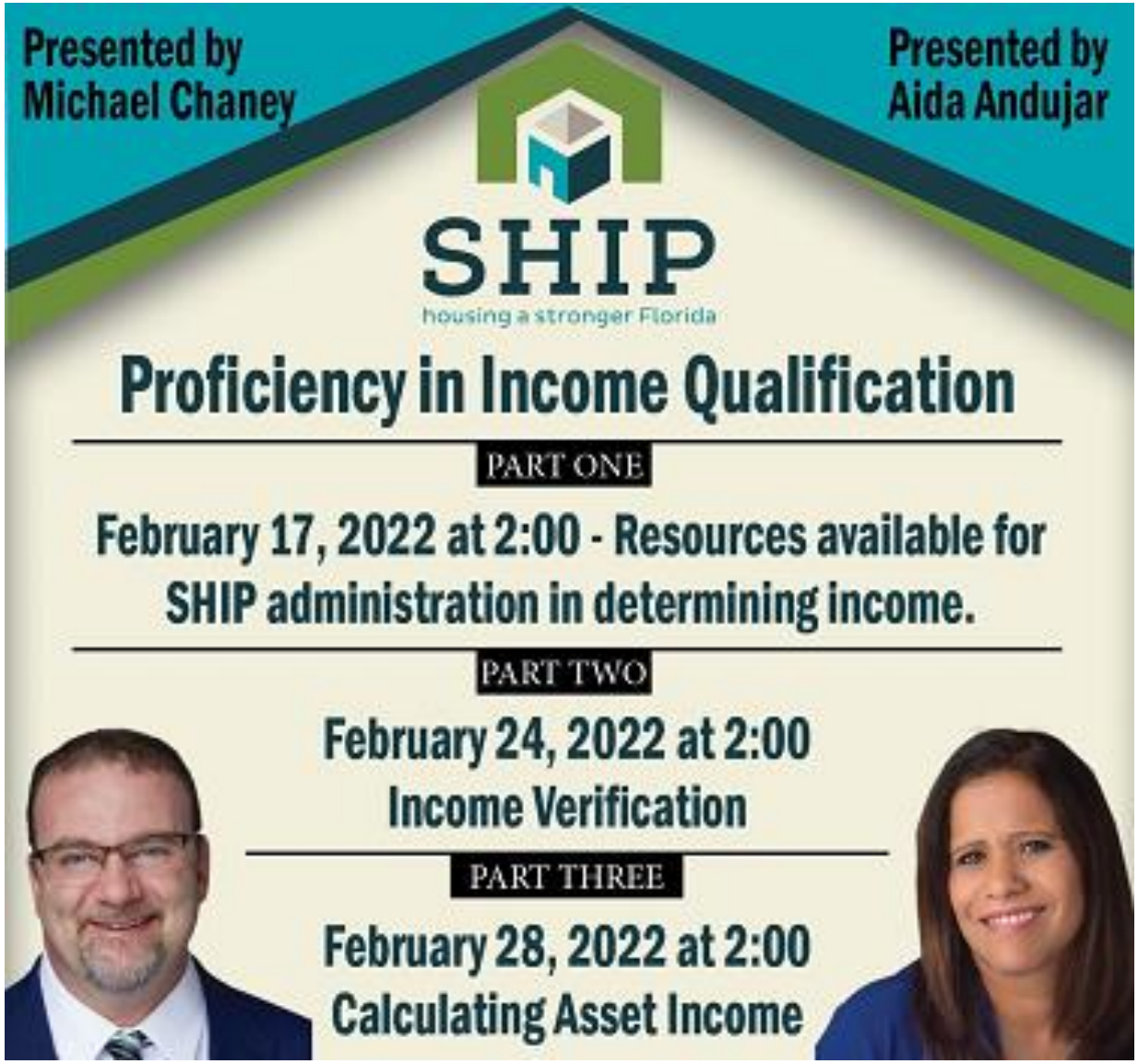
Florida Housing Coalition Hurricane Member Update Webinar

February 25, 2022
Sponsored by Fannie Mae

AGENDA

- Announcements
- Green Building: Considerations for Housing Assistance Programs



Register for Feb 28 at https://attendee.gotowebinar.com/register/2122760449821094672

FEMA

ebrief

HMA
Hazard Mitigation Assistance

You're Invited: 2022 Hazard Mitigation Grant Program Webinar Series

If you are interested in Hazard Mitigation Grant Program (HMGP) funding you may find FEMA's upcoming webinar series helpful. Next month FEMA is hosting an informative webinar series that will bring together subject-matter experts and practitioners to provide technical information, best practices, and tools and resources for submitting a successful HMGP application. The webinars are being designed for leaders in states, local communities, tribes and territories, as well as private sector entities, private non-profit organizations, and individuals.

HMGP 101 Program Overview
March 10, 2:30-4:00 p.m. Eastern Time

https://femacqpub1.connectsolutions.com/content/connect/c1/7/en/events/catalog.html?folder-id=221257069&from-origin=fema.connectsolutions.com

Training Announcement

Affordable Housing Funding Sources Part 1:

March 15, 2022 at 2:00pm

Register at
https://attendee.gotowebinar.com/register/9195494335965794831

Register at
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi5pdjygZv2AhVKDkQIHfnaBwUQFnoECAgQAQ&url=https%3A%2F%2Fflghc.org%2Fregistration%2F&usg=AOvVaw0BWfM-8xSuS8Chm2kblNMQ

2022 ANNUAL STATEWIDE AFFORDABLE HOUSING CONFERENCE

HOME **MATTERS** IN FLORIDA

Hosted by the FLORIDA HOUSING COALITION

August 29th – August 31st

IN-PERSON AT THE ROSEN CENTRE, ORLANDO FL

Green Building: Considerations for Housing Assistance Programs

Dr. Jennifer Languell
Trifecta Construction and
Florida Green Building
Coalition
jennifer@trifectaconstruction.com

FLORIDA HOUSING COALITION

THE FLORIDA HOUSING COALITION

Dr. Jennifer Languell

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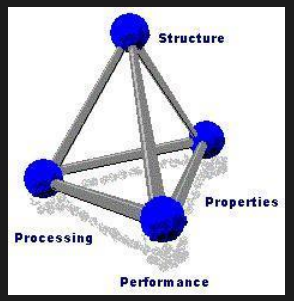

UNIVERSITY OF FLORIDA

CIVIL ENGINEERING

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Trifecta, since 2003

- Certified over 30 Million Square Feet of 3rd party certified single and multi-family residential
- Over 2 Million Square Feet of certified LEED Projects
- Over 4 Million Square Feet of Green Globes or FGBC Commercial
- Over 30,000 acres of certified Green Developments
- Active Board and Standard Committees
  - USGBC, FGBC, NAHB, Green Globes
- Host Discovery Channel's PROJECT EARTH
- Florida Contractor #1330049

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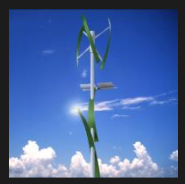


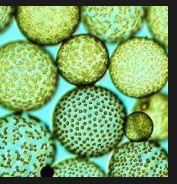




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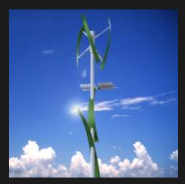


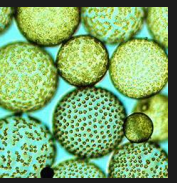




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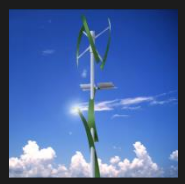


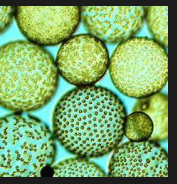




Before & After

Opa Locka FL

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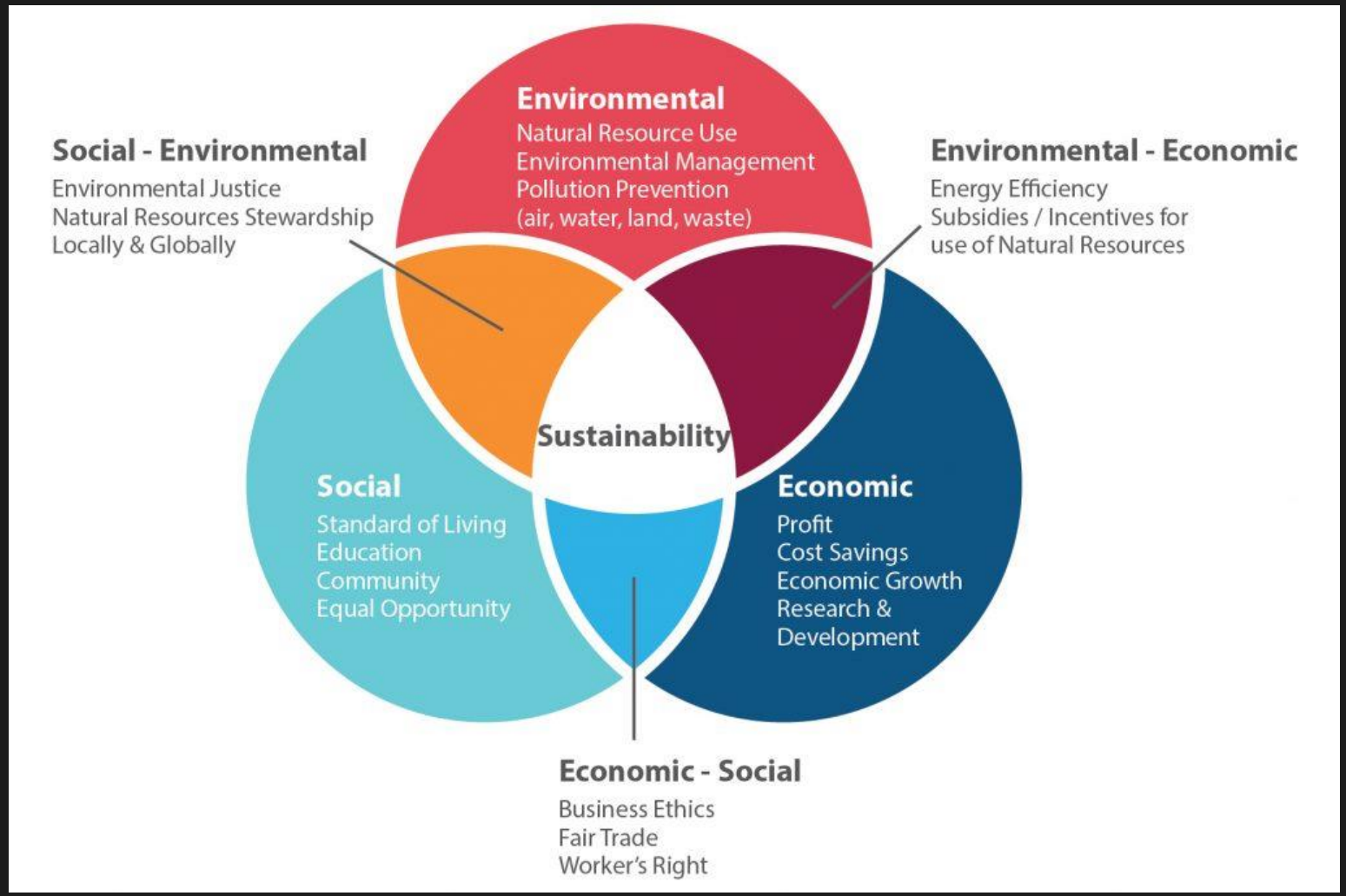
Sustainability



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Sustainability versus Resilience

Sustainability

- Energy Use Reduction (Efficiency)
- Water Use Reduction
- Renewable Energy Production
  - Solar, Wind, Hydro
- Rapidly Renewable
- Recycled & Local Materials
- Community Responsibility
- Transportation Access
- Indoor Environmental Quality
- Infill, Density, Redevelopment

Shared

- ✓ Energy Independence
- ✓ Water Independence
- ✓ Renewable Resources
- ✓ Long Term Environmental Effects
- ✓ Community Support
- ✓ Resource Storage

Resilience

- Multiple Diverse Energy Sources
- Multiple Water Sources
- Rainwater Harvesting, Wells, Desalinization
- Disaster Mitigation
- Elevated FFE above Flood Plain
- Non Coastal Construction
- Passive Systems
- Redundant Systems

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Sustainable

Meeting Florida's Annual Electricity Need Would Take:

Oil	Nuclear	Solar	Biomass	Wind
Enough oil to fill the Empire State Building 71 times	30 nuclear plants	Solar panels covering an area the size of Pinellas, Hillsborough, & Pasco counties ➢Enough to cover all of the roof space in Florida 4 ½ times	Energy crops covering almost 30% of the state	99,000 onshore wind turbines ➢Placed blade-to-blade, enough to cover Florida's entire coastline 3 ½ times

OR OR OR OR

X 71

X 30

Resilient

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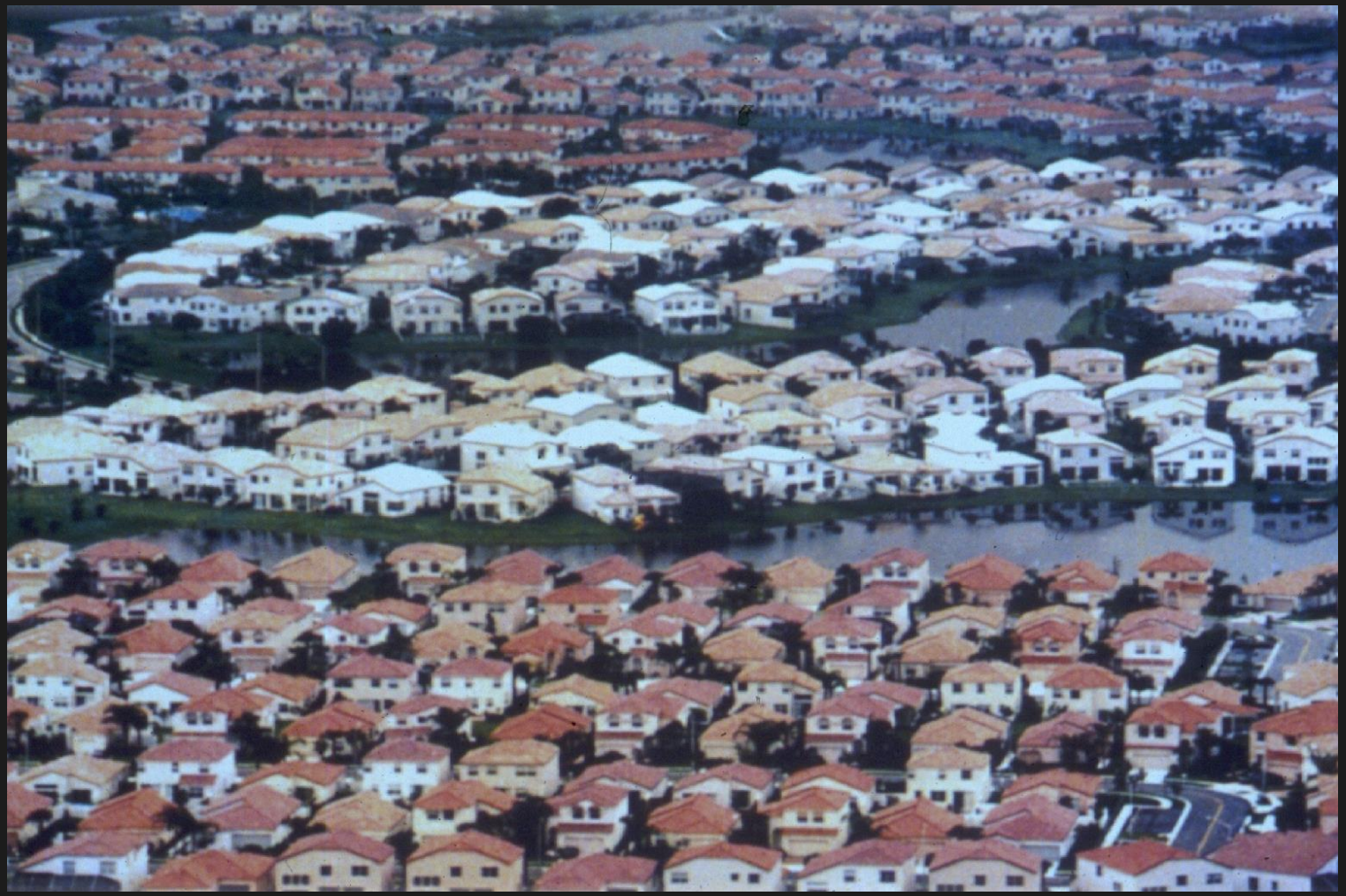
We don’t always have a good plan



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Development Challenges

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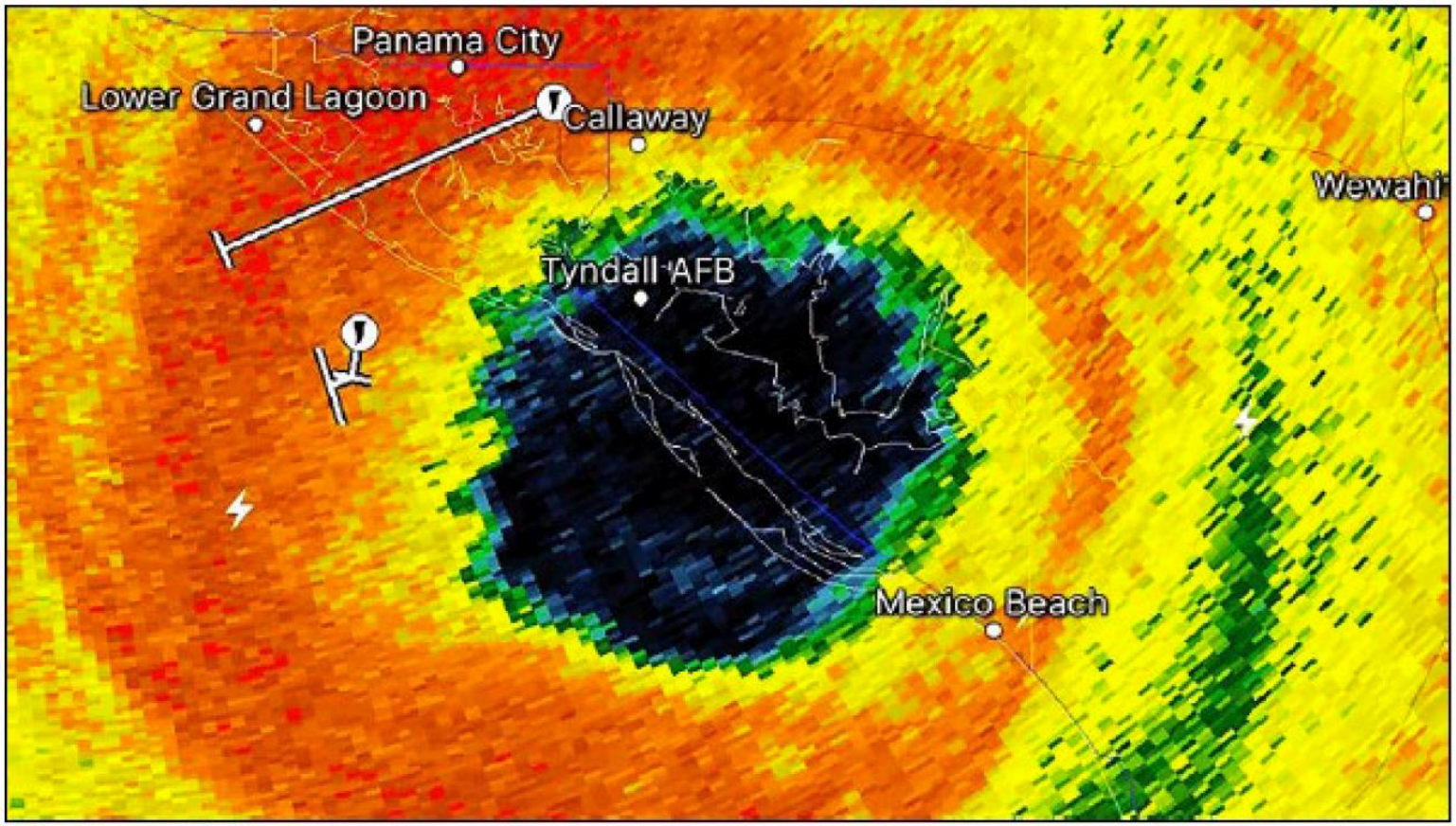
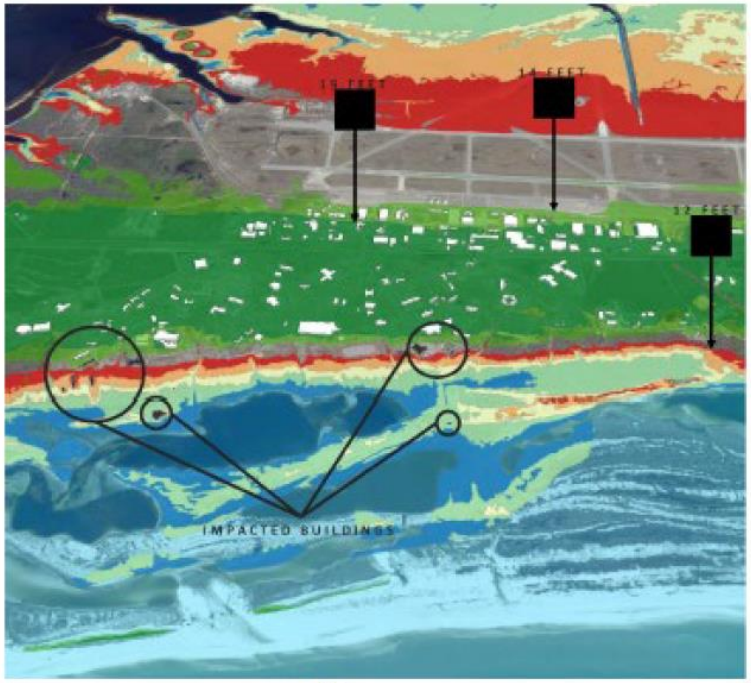


Radar image of Hurricane Michael's eye passing over Tyndall AFB

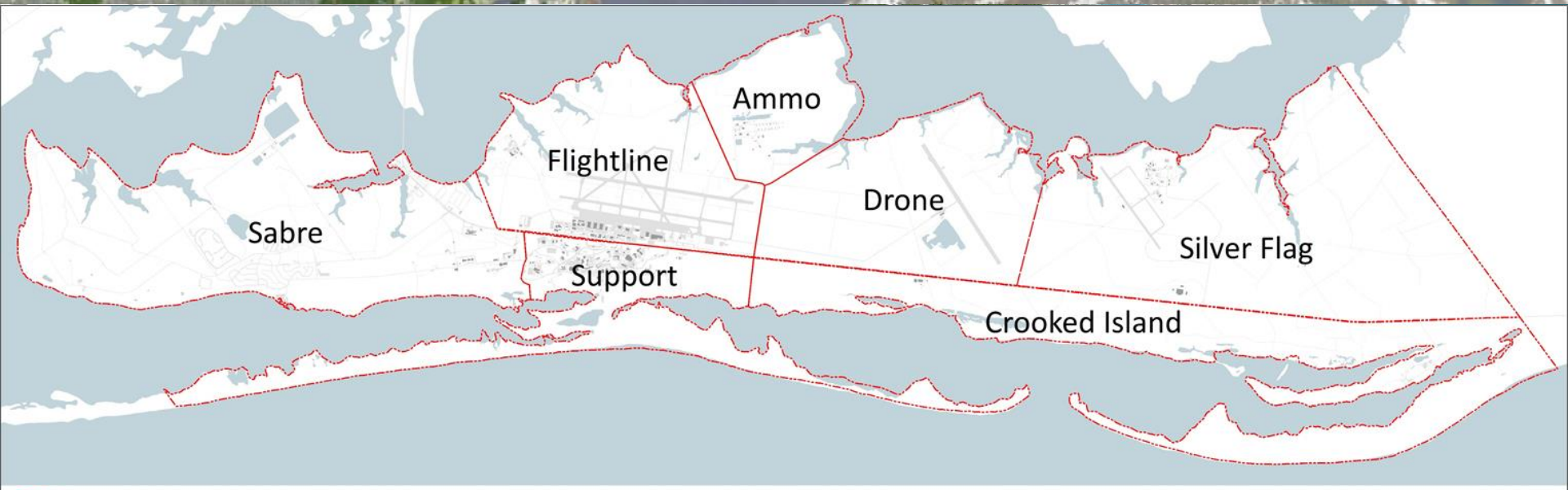
Hurricane Michael

In October 2018, Tyndall Air Force Base was hit with a **category five hurricane** which resulted in **damage to 100% of its assets**.



155 MPH
Sustained Winds

15.55’
Storm Surge at Mexico Beach



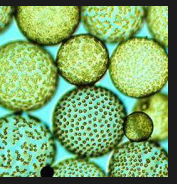
Planning District Boundaries

SOURCE: Tyndall Air Force Base.
CREATED: 7/17/2020













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Natural Disaster

50%-70% of existing FL homes NOT TO CODE

25% of Keys homes IRMA destroyed (FEMA estimate)

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Age of Housing Units in Florida

- Hurricane Andrew CHANGED building codes 25 years ago
- Age of Homes

	Prior to 1960	1960 – 1969	1970 – 1979	1980 – 1989	1990 – 1999	2000 – 2009	2010 - 2015
Single Family	725,235	464,072	692,471	864,170	858,390	1,017,411	164,176
Multi-Family	149,221	193,525	473,388	490,142	340,678	340,960	77,194
Total Units	874,456	657,597	1,165,859	1,354,312	1,199,068	1,358,371	241,370

4,111,758	Pre Andrew
2,199,275	Post Andrew
6,311,033	Total
6,337,929	Census (“Households”)

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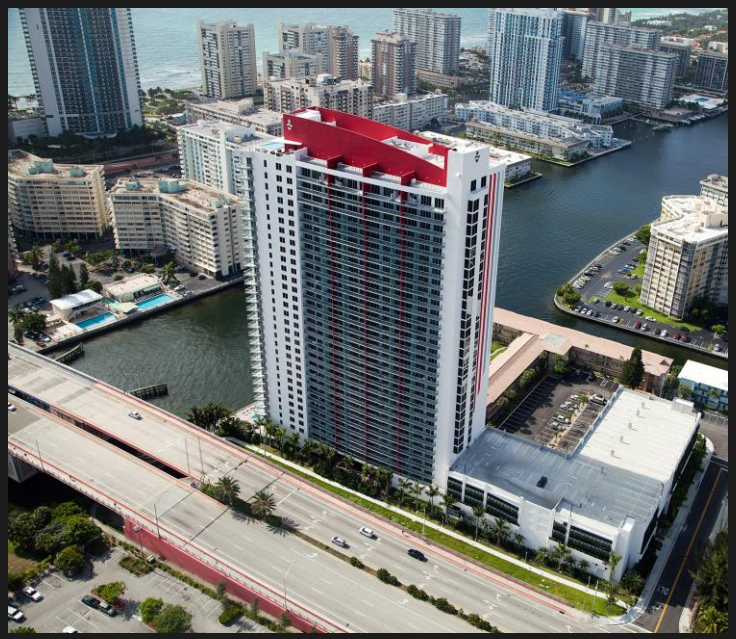
What about optimal design?

What is Green Building?

A "Noun"



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What is Green Building?

A "Verb"

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Rating Systems

US Green Building Coalition (USGBC)

Leadership in Energy and Environmental Design - LEED

2009 Construction and Major Renovations (NC/MR)

Green Building Initiative (GBI) - BREEAM

Green Globes

Florida Green Building Coalition (FGBC)

Green Commercial Building Standard

NAHB – National Innovation Research Lab

National Green Building Standard

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Green Home Certification

1. Energy
2. Water
3. Lot Choice
4. Site
5. Health
6. Materials
7. Durability
8. General

FGBC
FLORIDA GREEN BUILDING COALITION

Floridagreenbuilding.org

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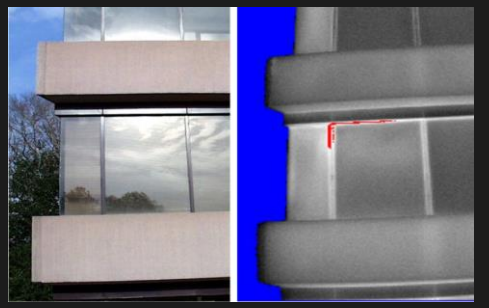
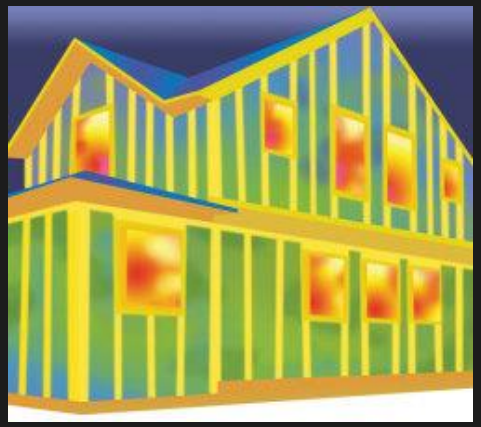
Buildings have 3 Systems

1. Non – energized (envelope)
   - Windows
   - Doors
   - Roofs
   - Walls





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Buildings have 3 Systems

2. Energized
   - HVAC
   - Lighting
   - Water Heating
   - Plug Loads
   - Process Loads

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Buildings have 3 Systems

3. Human
   - Come in building, turn things on
   - And sometimes off
   - Leave door and windows open
   - Require heat, light, air…

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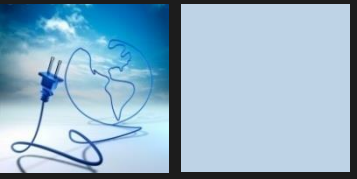





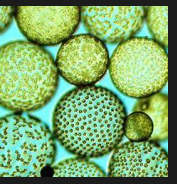


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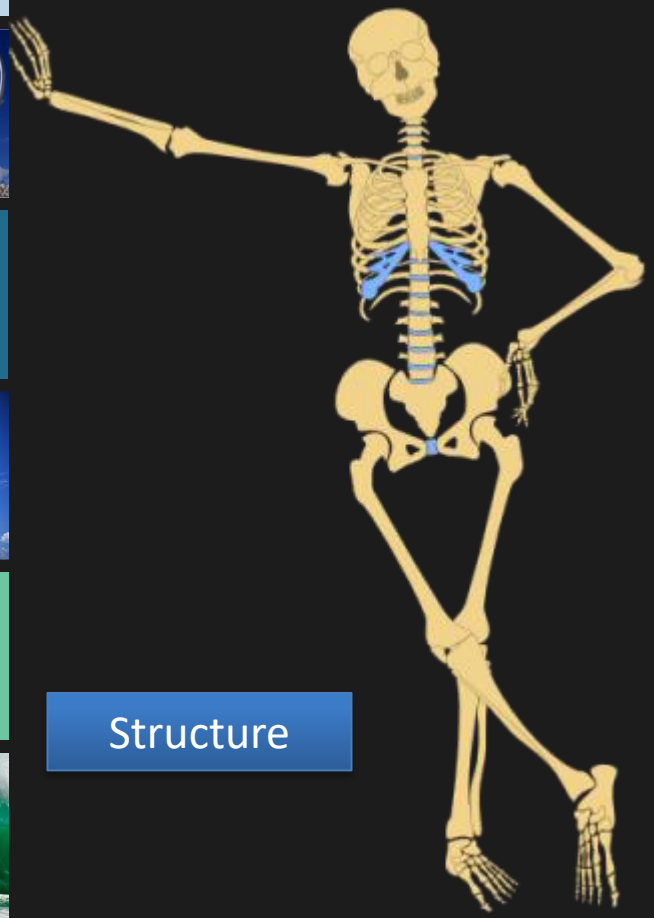
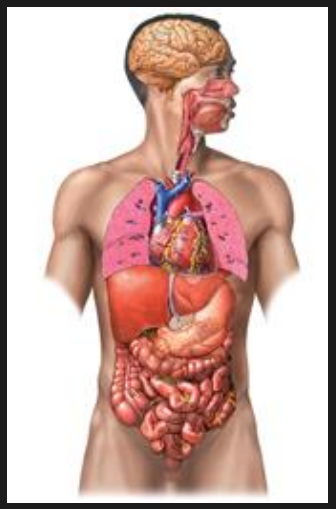
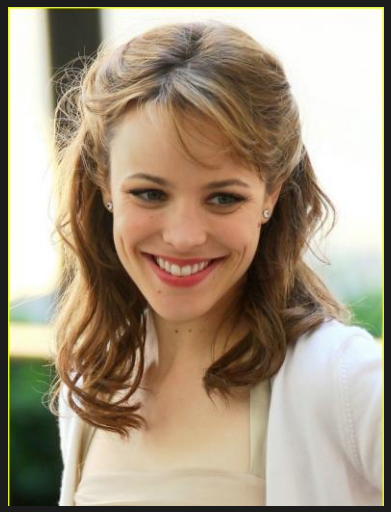
Whole-House Approach



Structure



Systems



Trim

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Whole-House Approach

Systems

Structure

Trim

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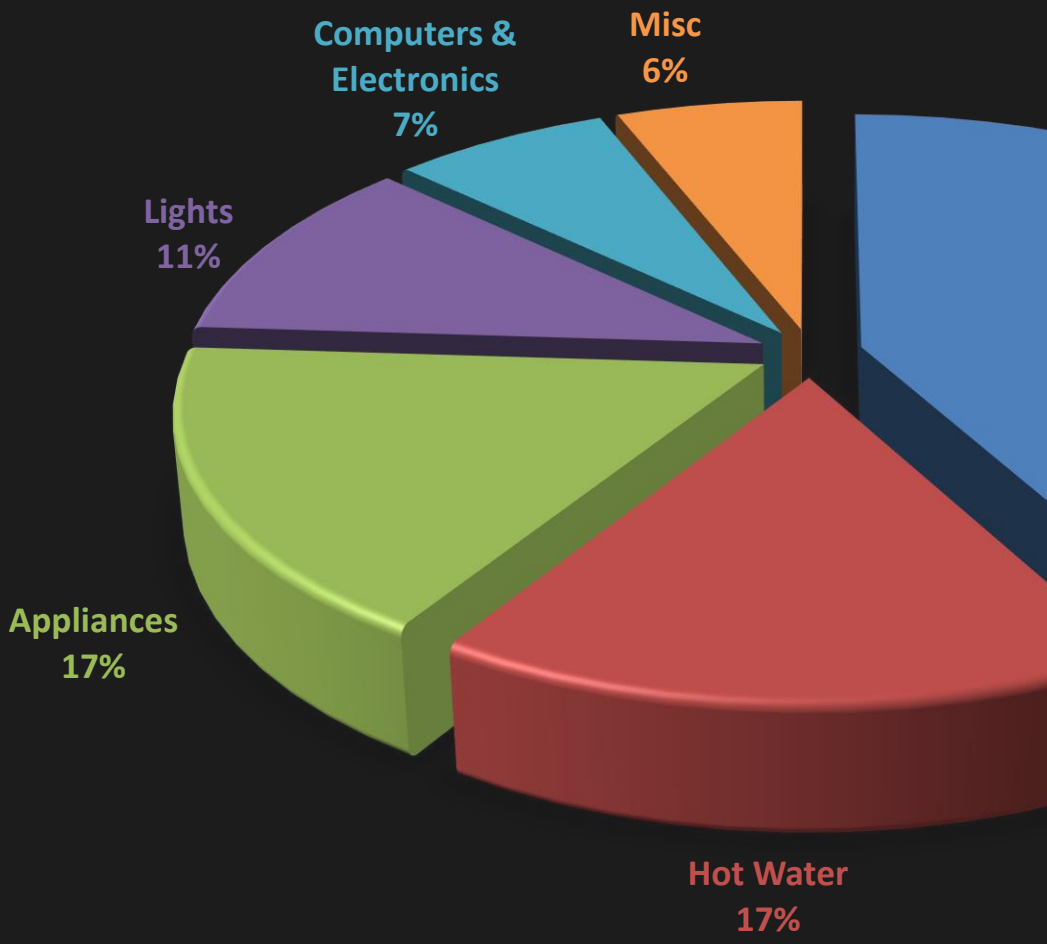
Residential Energy Use – Florida



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Are these Efficient Buildings?

80 kBtu/SF/YR

STATEMENT OF ENERGY PERFORMANCE
Margrave High School

Building ID: 1027125
For 12-month Period Ending: January 31, 2004[1]

Date SEP Generated: March 30, 2004

Margrave High School
12000 Hwy 56
Longmont ID 83229

Gross Building Area: 351,355 ft²
Year Built: 1983

Owner
Cadmus Group
Contact: John Doe
1901 North Fort Myer Drive
Suite 900
Arlington VA 22209
(703) 247-6000

Facility Space Use Summary

Space Type	Area(ft²)	Number of Students	Number of PCs	Cooling Percent
Computer Data Center	134	N/A	N/A	N/A
K-12 Schools	351,221	1,121	420	100

Site Energy Use Summary

Electricity (kBtu)	5,649,801
Propane (kBtu)	320,419
Natural Gas (kBtu)	0
Total Energy (kBtu)	5,970,220

Professional Verification
John Doe
1901 North Fort Myer Drive
Suite 900
Arlington VA 22209
(703) 247-6000

Licensed Number: 123456789
State: VA

Results

Energy Performance Rating[2] (1-100)	94
Energy Intensity[3]	
Site (kBtu/ft²-yr)	17
Source (kBtu/ft²-yr)	49.4
Emissions	
CO_2 (1000 lbs/yr)	6,701
SO_2 (1000 lbs/yr)	366
NO_x (1000 lbs/yr)	21
Energy Cost	
Cost ($/yr)	$254,465
Intensity ($/ft²-yr)	$0.72

Indoor Environment Criteria[4]

Indoor air pollutants controlled?	Yes
Adequate ventilation provided?	Yes
Thermal conditions met?	Yes
Adequate illumination provided?	Yes

Professional Engineer Stamp

Based on the conditions observed at the time of my visit to this building, I certify that the information contained on this statement is accurate.

Notes:
1. Application for ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of ENERGY STAR is not final until approval is received from EPA.
2. An energy performance rating of 75 is the minimum required rating to be considered eligible for ENERGY STAR.
3. Values represent energy intensity, annualized to a 365 day calendar.
4. Based on meeting ASHRAE Standard 62-1999 for indoor air quality, ASHRAE Standard 55-1992 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

Tracking Number: SEP20040330000001004542

18.7 Mbtu/yr

Form FREER-2008

Confirmed Rating

ATLANTIC HOUSING
631 Serenity Circle
Debary, FL 32713-

Title: SC5-6318_

Design: Orlando, FL
TMY: ORLANDO_INTL_ARPT, FL

BUILDING ENERGY RATING GUIDE

$0 — $646 — Reference $1091

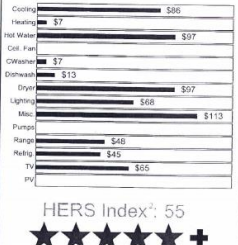
0 MBtu — 18.7 MBtu — 32 MBtu

Proposed Home
Savings = $445

Cost Basis:
Progress Energy
Florida Average
Statewide Prices

Electric Rate: $0.118 /kWh
Gas Rate: $0.682 /Therm
Oil: $1.10/gal LP Gas: $1.40/gal

This Home may Qualify for EPA's ENERGY STAR Label
This Home Qualifies for an Energy Efficient Mortgage (EEM)



HERS Index[2]: 55

GARY CARMACK
Certified Rater

456
I.D. Number

Signature

Date

This Rating Guide is provided to you by a Home Energy Rater who is trained and certified to perform Ratings in accordance with the RESNET standard. Questions or complaints regarding this Rating may be directed to:
EnergyGauge Program Office
1679 Clearlake Road
Cocoa, FL 32922-5703
(321)638-1492
engauge@fsec.ucf.edu

RESNET ID: 504241339

NOTES:
[1] The home builder must have signed a Memorandum of Understanding with EPA as an ENERGY STAR Homes partner.
[2] HERS Index calculated in accordance with 2006 RESNET standard. Section 303.2 (Reference home = 100, Zero energy use = 0).

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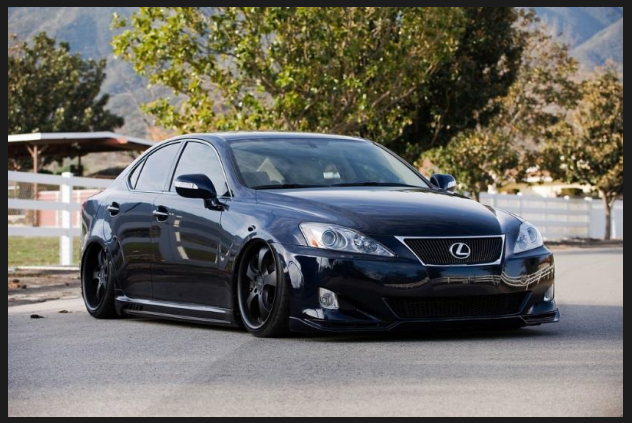
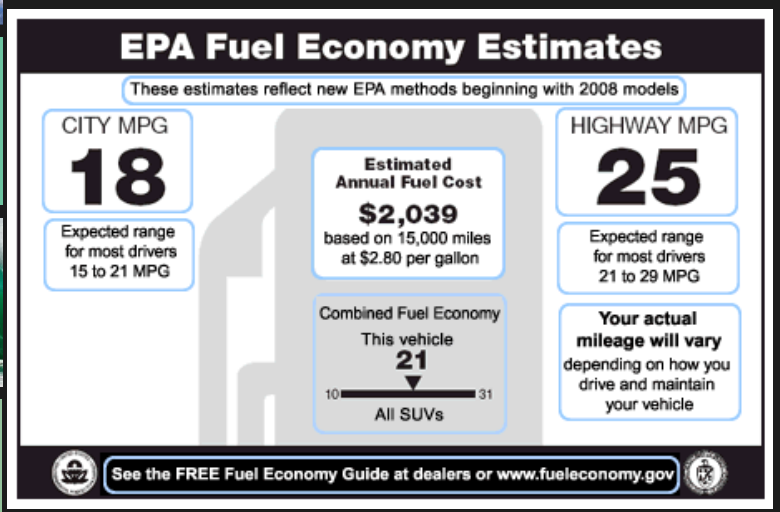
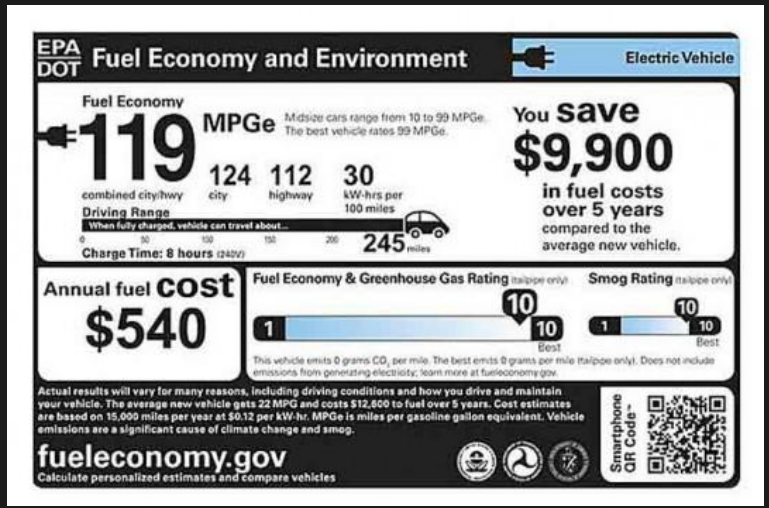
KISS– Which is more efficient







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HERS – Home Energy Rating System

HIGH ENERGY USE

Low HERS Index Save Energy

ZERO Energy Use

280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0

Typical New Home 1979

Typical New Home 1982

Typical New Home 1997

Typical New Home 2004

Florida Code

Energy Star HI = Varies

Zero Energy Home

ENERGY STAR

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What is a HERS Index?

Confirmed Rating
RESNET Registration No.: 791674037

Lennar Homes - SW Florida
13520 Saw Palm Creek Trail
Bradenton, FL 34211

Design: Sarasota, FL
TMY: SARASOTA_BRADENTON, FL

Title: Savanna at Lakewood Ranch Lot 109

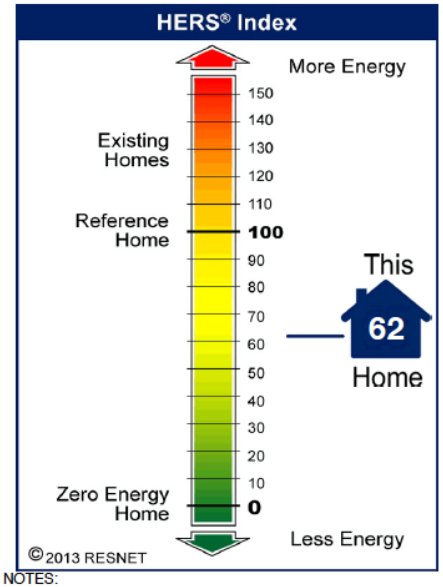
HOME ENERGY RATING GUIDE

$0 — **$1190** — Reference $1790

Annual Energy Cost:	This Home	Savings
Electricity	$ 975	$ 502
Natural Gas	$ 215	$ 98
LPG	$ 0	$ 0
Fuel Oil	$ 0	$ 0
On-Site Power	$ 0	$ 0
Totals:	**$ 1190**	**$ 600**

Annual Energy Use:	This Home	Savings
Electricity (kWh/y)	8516	4388
Natural Gas (therms/y)	120	54
LPG (gal/y)	0	0
Fuel Oil (gal/y)	0	0
On-Site Power (kWh/y)	0	0

Annual Emissions:	This Home	Savings
CO2 (tons/y)	6	3
SO2 (lb/y)	19	10
NOx (lb/y)	1120	511



NATIONAL MORTGAGE INDUSTRY — No. 1998-171 — HERS ACCREDITATION REGISTRY

Ryan McCracken	4281370
Certified Rater	I.D. Number
Ryan McCracken	6/28/2017
Signature	Date

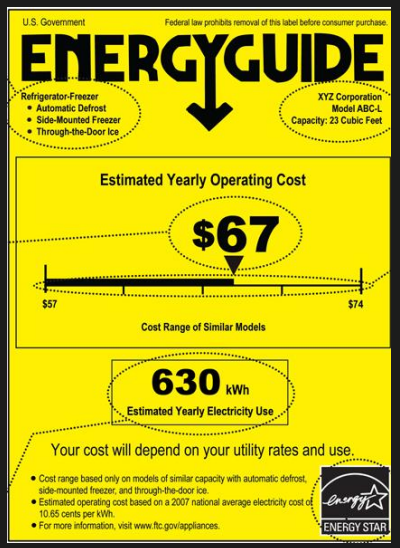
The Home Energy Rating Standard Disclosure for this home is available from the Rating Provider. Questions or complaints regarding this Rating may be directed to:

SkyeTec Energy Rating Services
1679 Clearlake Road
Cocoa, FL 32922-5703
phone: (321)638-1492
e-mail: engauge@fsec.ucf.edu
www.energygauge.com/usares/

NOTES:
HERS and RESNET are Trademarks of Residential Energy Services Network, Inc. (www.resnet.us)
EnergyGauge is a Trademark of the Florida Solar Energy Center (www.fsec.ucf.edu)

EnergyGauge® Energy Analysis & Rating Software

6/28/2017 11:57:33 AM — EnergyGauge® v5.1(RESNET Standard 2014) — Page 1/1



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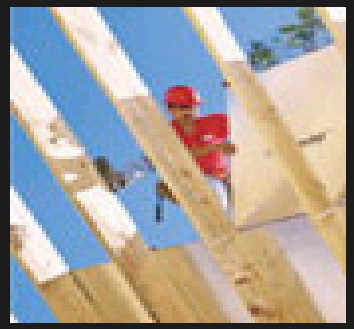
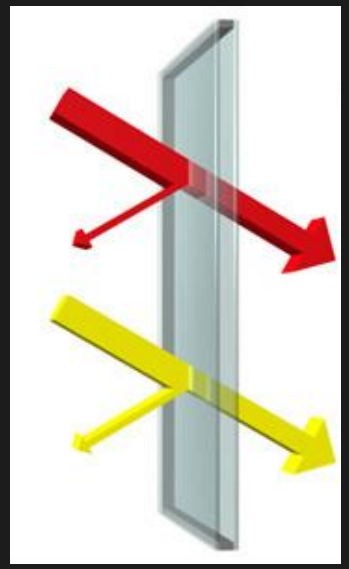
Prescriptive

- Floors/Foundation
- Walls
- Roof/Ceiling
- Doors/Garage
- Mechanical
- Hot Water
- Appliances
- Windows
- Lighting/Controls






Improve Insulation

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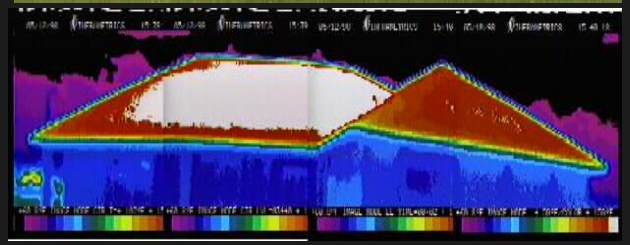
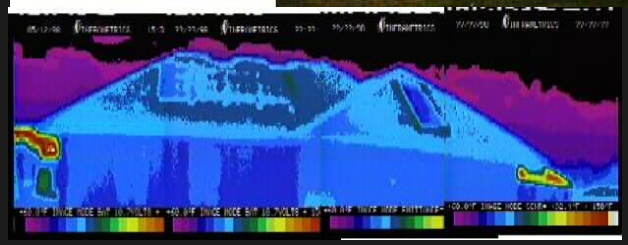
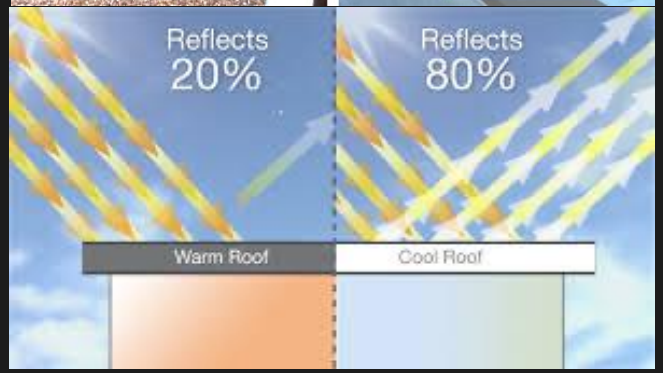
Roof Color Matters







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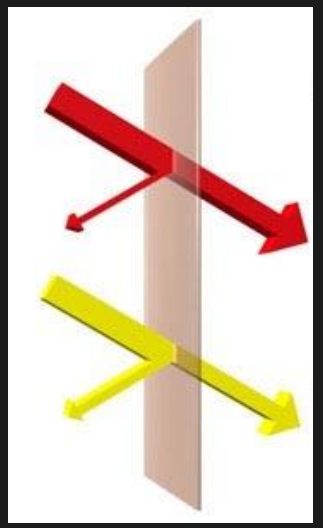
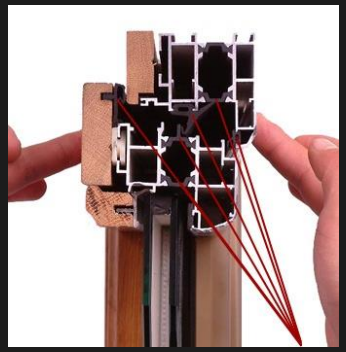
Windows

- U- Factor
- Solar Heat Gain Coefficient
- Tint (SHGC)
- Frame and glazing options – aesthetics (U)
- Insulated glass – climate or sound (U)
- Low-E glass – “window radiant barrier” (U)
- Low-conductance gas fillings (U)
- Composite spacers – thermal breaks



WINDOWS			
CLIMATE ZONE	U-FACTOR[1]	SHGC[2]	
Northern	≤0.27	Any	Prescriptive
	=0.28	≥0.32	Equivalent Energy Performance
	=0.29	≥0.37	
	=0.30	≥0.42	
North Central	≤ 0.30	≤ 0.40	
South Central	≤ 0.30	≤ 0.25	
Southern	≤ 0.40	≤ 0.25	



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Appliances and Controls

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And We Have Holes…Airflow Holes

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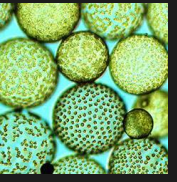
Building Envelope















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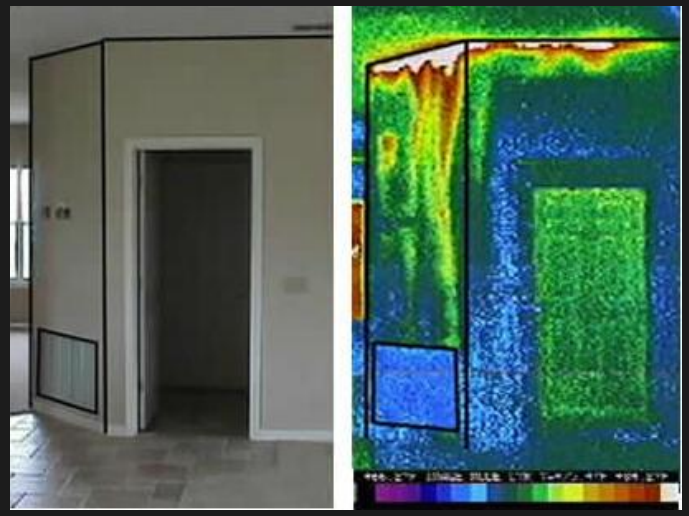
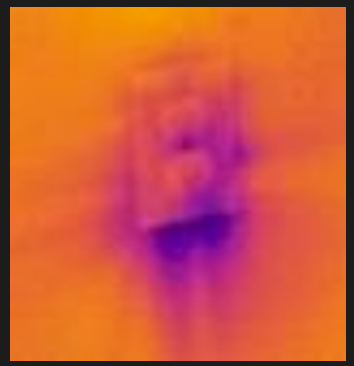
Small Air Leaks Add Up

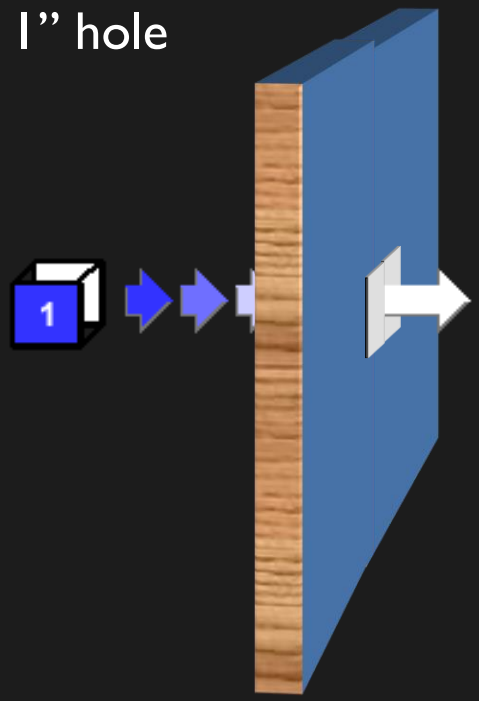
Example:
- Negative pressure from bath fan





- Air holds moisture
- Air moves due to pressure differences

1” x 1” hole



OVER 18 Gallons of Water
During cooling season

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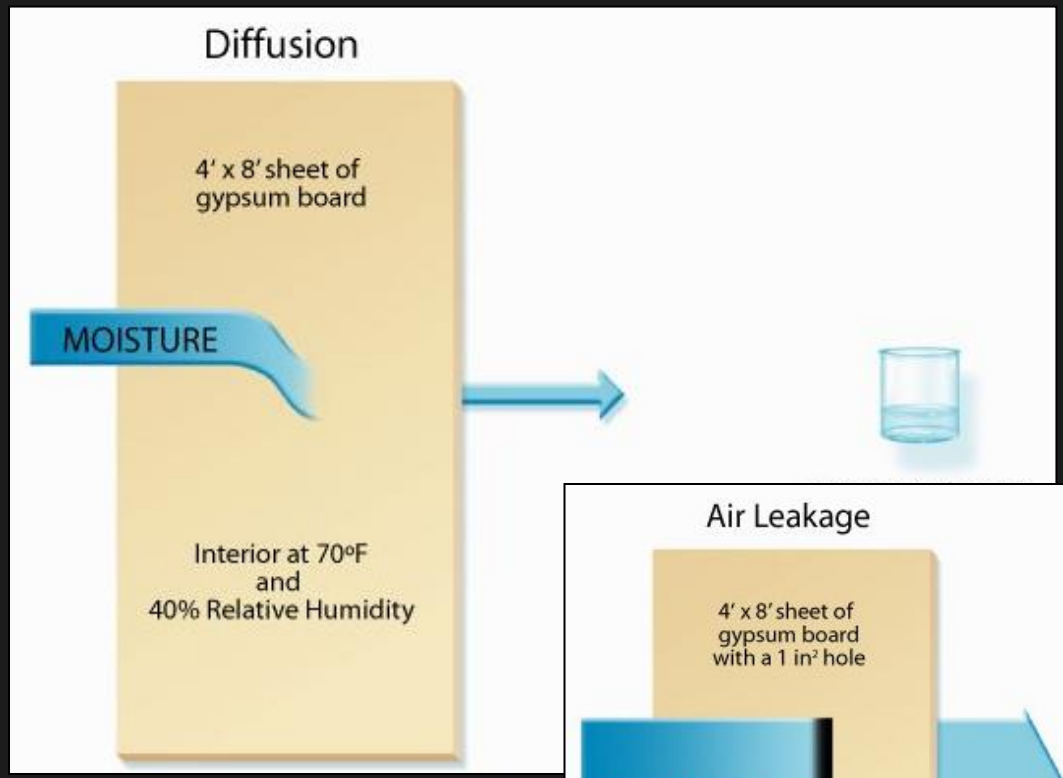
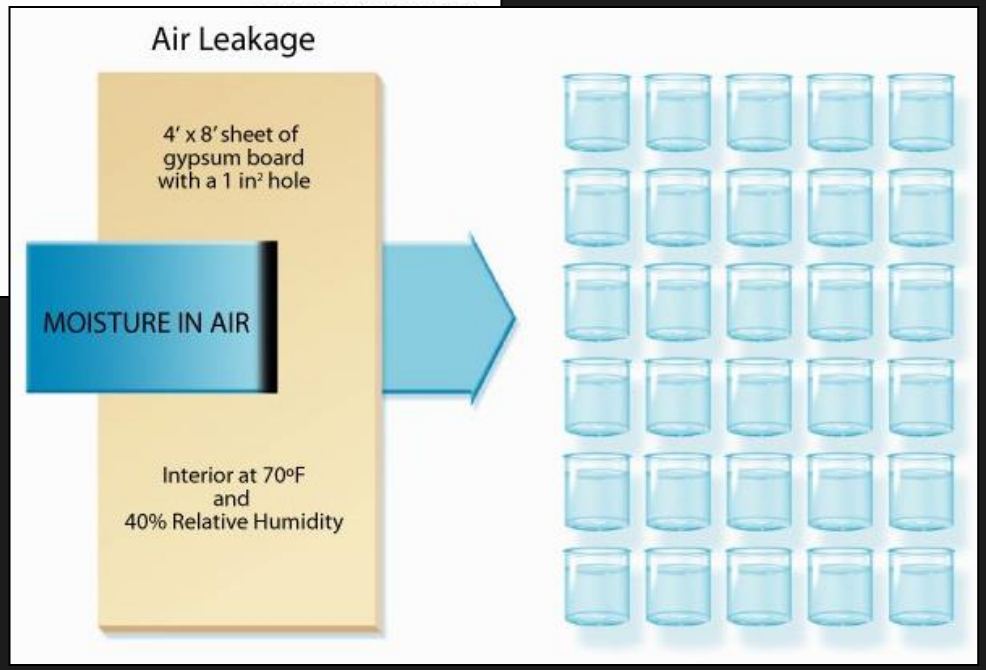
Moisture Movement





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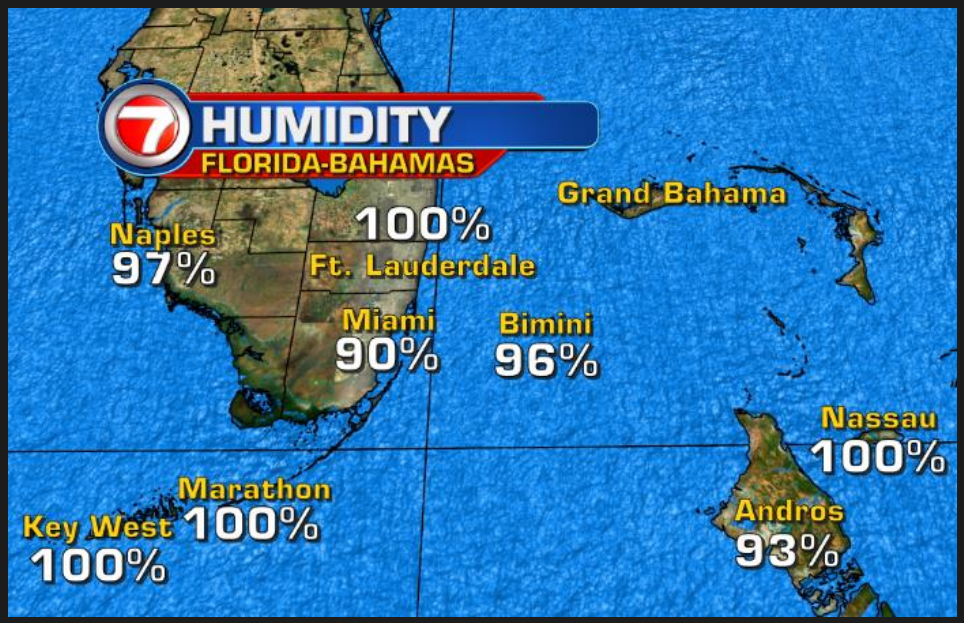
Our Biggest Issue - Moisture

- Bulk Moisture
- Ambient Moistures
  - Deflect, Drain, Dry
  - Durability, Doability



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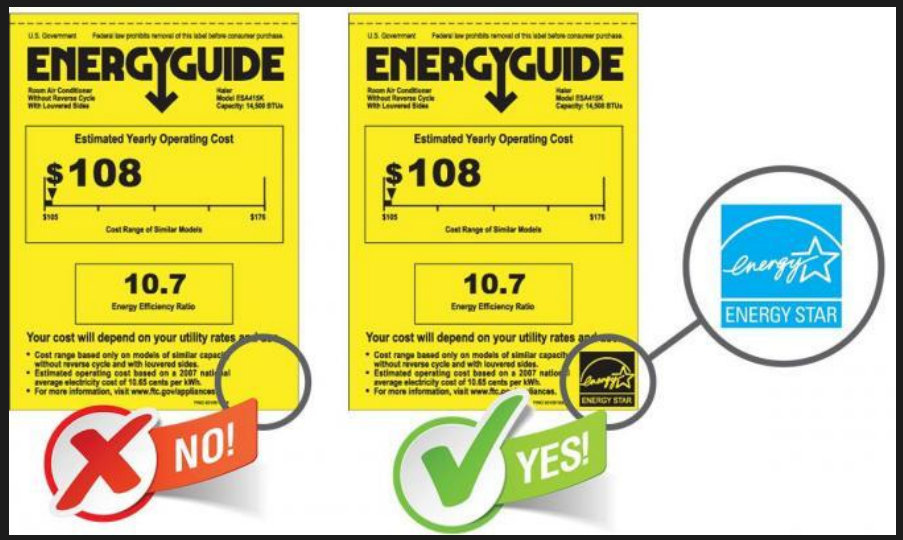
Biggest Impact On Energy Efficiency

- Insulation
- Infiltration
- Window Efficiency
- Appliances
- Lighting
- Controls



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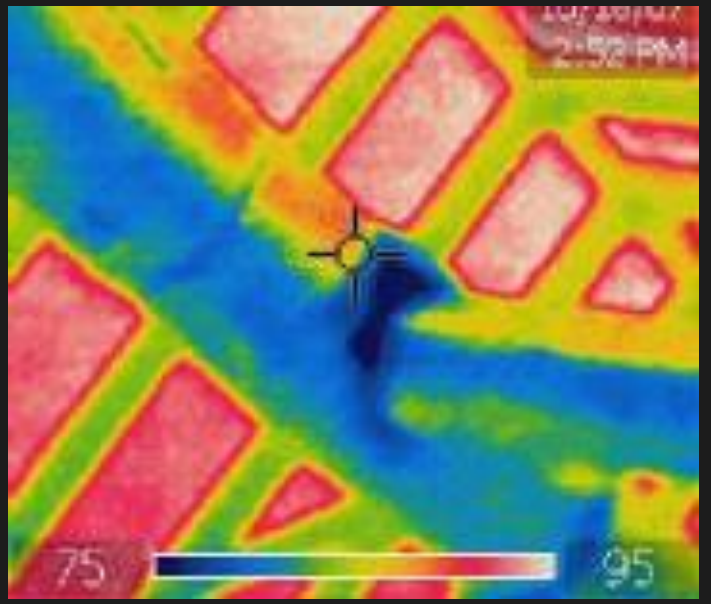
Field Finds



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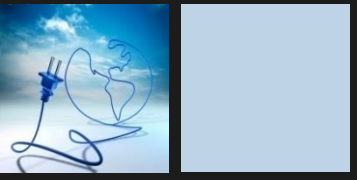
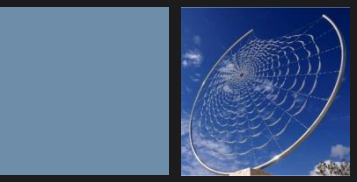
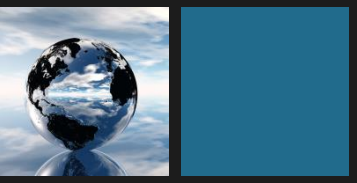
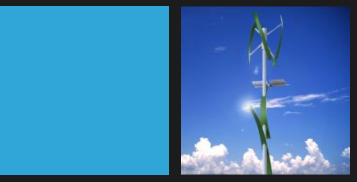
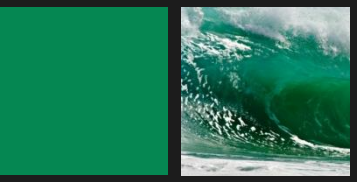
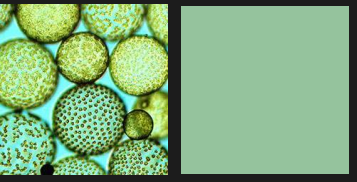
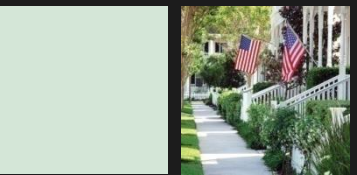
Certification Process

1. Plan Review
2. Builder Review Checklist
3. Green Rows ARE on the plans
4. Yellow Rows ARE Site and/or Plan Specific
5. Contact/Contract a FGBC Certifying Agent (CA)
6. Builder Provide Documentation – as requested (cut sheets etc.) to CA
7. CA Midpoint Inspection and photos – PRE DRYWALL
8. CA/Energy Rater
    1. Blower Door
    2. Duct Blaster Tests to get Confirmed HERS
    3. Envelope Leakage Test to get CO.
9. CA Final Inspection and photos
10. CA submits application to FGBC
11. FGBC Certifies HOME

CATEGORY 1: ENERGY

Category Minimum 30 / Category Maximum 75 — Revised 2-18-2021

	Points Achieved	Points Possible	Criteria		Certifying Agent Notes
E1 HERS Index - Energy Rating					
E1.01.a	30	3 - 75	Confirmed Florida HERS Rating - 3 points for each HERS Index point below 75		
		Yes	Does the Home have a confirmed HERS Index		Required for Certification
		65	Confirmed HERS Index		
OR, For Multi-Family Prescriptive Energy Option					
E1.01.b	0		See E1.01b Tab for Multi-Family Energy Options, score will automatically be transferred to this page		
E2 ENERGY – DESIGN, FIELD TESTING AND INSPECTIONS, FINISHES, AMENITIES					**Certifying Agent Notes**
E2.01	1	1	1	Thermal Enclosure System Inspection - This credit is NOT available if you claim E1.01.b or E5.07	
E2.02	1	1	Ductwork joints sealed with mastic		called out on M0.1
E2.05	1	1	Roofed porch, Min 100ft^2 AND meets cross-ventilation requirements		All plans comply
E2.11		1	Floor joint perimeter insulated and sealed		Stick Frame should comply
E2.12		1	Light colored exterior walls (80% minimum)		TBD - need paint color to determine
			Enter the Solar Reflecive Index (SRI) of Paint		
E2.13	2	1 - 2	Light colored interior walls, ceilings, carpet/floors		A6.01
		Yes	all major living spaces wall and ceiling surfaces have a reflectance of at least 50%		
		80.0	Enter the Light Reflectance Value (LRV) of Paint		
		Yes	bedrooms and all major living spaces have floors, that are light-colored		
		80.0	Enter the Light Reflectance Value (LRV) of floor		
E2.14	1	1	Maximum 52w Fixtures in Bathrooms		E1.0 Energy Star Qualified Fixtures
E2.19	1	1	Energy-efficient ovens/ranges		Sheet A1.11
E2.21		1, 3, 4	Efficient well pumping 1 Point: Efficient Well Pump 3 Points: Efficient Pool Pump 4 Points: Both		If property is on well & pump needs to be rep
E2.22	1	1	Efficient envelope volume		
		1804	Total Gross Wall Area		worst case complies
		1580	Conditional Square Footage		
		2	Number of Stories		
E2.25	3	3	Energy Star® Ceiling Fans		Ceiling fans MUST be Energy Star
E2.26	2	2	Outdoor lights are energy efficient.		E1.0 Energy Star Qualified Fixtures
	43	112	Total Possible Points		
	43		Total points for Category 1 (30 min / 75 max)		
			Name of HERS Rater:		
			Certifying Agent Category 1:		

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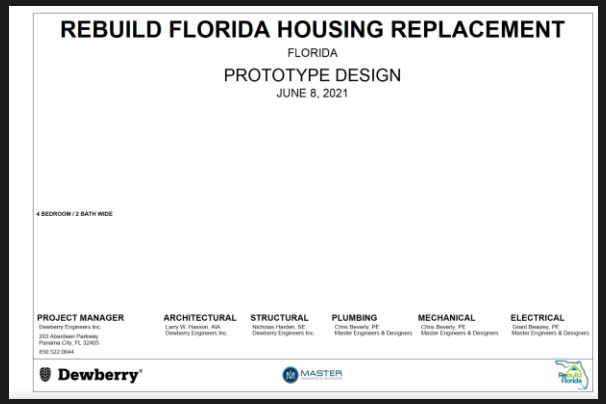
Example


REBUILD FLORIDA HOUSING REPLACEMENT

FLORIDA

PROTOTYPE DESIGN

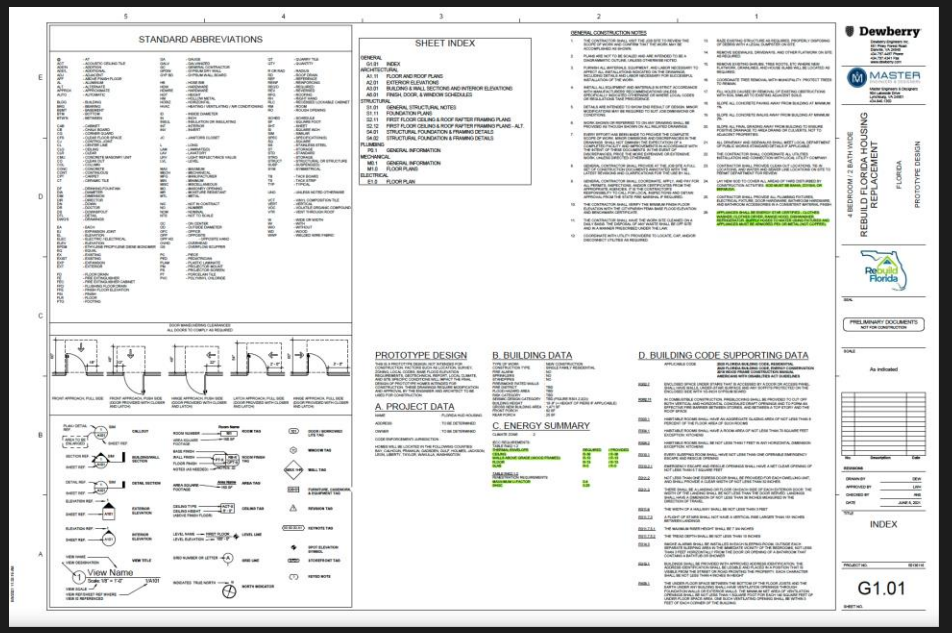
JUNE 8, 2021

4 BEDROOM / 2 BATH WIDE

PROJECT MANAGER	ARCHITECTURAL	STRUCTURAL	PLUMBING	MECHANICAL	ELECTRICAL
Dewberry Engineers Inc. 203 Aberdeen Parkway Panama City, FL 32405 850 522 0644	Larry W. Hanson, AIA Dewberry Engineers Inc.	Nicholas Harden, SE Dewberry Engineers Inc.	Chris Beverly, PE Master Engineers & Designers	Chris Beverly, PE Master Engineers & Designers	Grant Beverley, PE Master Engineers & Designers

Dewberry

MASTER


STANDARD ABBREVIATIONS

SHEET INDEX

PROTOTYPE DESIGN

A. PROJECT DATA

B. BUILDING DATA

C. ENERGY SUMMARY

D. BUILDING CODE SUPPORTING DATA

Dewberry

MASTER

4 BEDROOM / 2 BATH WIDE REBUILD FLORIDA HOUSING REPLACEMENT

FLORIDA

PROTOTYPE DESIGN

PRELIMINARY DOCUMENTS NOT FOR CONSTRUCTION

INDEX

G1.01

26. APPLIANCES SHALL BE ENERGY STAR CERTIFIED - CLOTHES WASHER, CLOTHES DRYER, RANGE HOOD, DISHWASHER, REFRIGERATOR. SUPPLY HOSES TO WATER USING FIXTURES AND APPLIANCES MUST BE ARMORED PEX OR METAL (NOT COPPER).

M3 Durability				Certifying Agent Notes
M3.01	1	1	Roof slope ≥ 3 in 12 but ≤ 6 in 12	S2.11
M3.02	1	1	Large overhangs (eave and gable)	S4.02
M3.06		1	Plants/turf minimum of 2-ft. from foundation	
M3.07		1	Sprinklers and emitters are located a minimum of 2 ft from foundation	
M3.08	1	1	Use armored, PEX, or metal hoses (except copper) from service to all fixtures/appliances	G1.01 note 26
M3.10	1	1	Access panel to non-accessible plumbing fixture installed	P0.1
	8	47	Total Possible Points	
	8	Total points for Category 6 (10 min / 35 max)		
	Certifying Agent Category 6:			

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FGBC Energy

CATEGORY 1: ENERGY

Category Minimum 30 / Category Maximum 75 — Revised 2-18-2021

	Points Achieved	Points Possible	Criteria			Certifying Agent Notes
E1 HERS Index - Energy Rating						
E1.01.a	30	3 - 75	Confirmed Florida HERS Rating - 3 points for each HERS Index point below 75			
				Yes	:Does the Home have a confirmed HERS Index	Required for Certification
				65	:Confirmed HERS Index	
OR, For Multi-Family Prescriptive Energy Optiton						
E1.01.b	0		See E1.01b Tab for Multi-Family Energy Options, score will automatically be transferred to this page			
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E2.01	1	1		1	Thermal Enclosure System Inspection - This credit is NOT availabe if you claim E1.01.b or G5.07	
E2.02	1	1	Ductwork joints sealed with mastic			called out on M0.1
E2.05	1	1	Roofed porch, Min 100ft^2 AND meets cross-ventilation requirements			All plans comply
E2.11		1	Floor joist perimeter insulated and sealed			Stick Frame should comply
E2.12		1	Light colored exterior walls (80% minimum)			TBD - need paint color to determine
					Enter the Solar Reflecive Index (SRI) of Paint	
E2.13	2	1 - 2	Light colored interior walls, ceilings, carpet/floors			A6.01
				Yes	all major living spaces wall and ceiling surfaces have a reflectance of at least 50%	
				80.0	Enter the Light Reflectance Value (LRV) of Paint	
				Yes	bedrooms and all major living spaces have floors, that are light-colored	
				80.0	Enter the Light Reflectance Value (LRV) of floor	
E2.14	1	1	Maximum 52w Fixtures in Bathrooms			E1.0 Energy Star Qualified Fixtures
E2.19	1	1	Energy-efficient ovens/ranges			Sheet A1.11
E2.21		1, 3, 4	Efficient well pumping 1 Point: Efficient Well Pump 3 Points: Efficient Pool Pump 4 Points: Both			If property is on well & pump needs to be replace
E2.22	1	1	Efficient envelope volume			
				1804	Total Gross Wall Area	worst case complies
				1580	Conditional Square Footage	
				2	Number of Stories	
E2.25	3	3	Energy Star® Ceiling Fans			Ceiling fans MUST be Energy Star E1.01 Note 6
E2.26	2	2	Outdoor lights are energy efficient.			E1.0 Energy Star Qualified Fixtures
	43	112	Total Possible Points			

43 Total points for Category 1 (30 min / 75 max)

Name of HERS Rater:

Certifying Agent Category 1:

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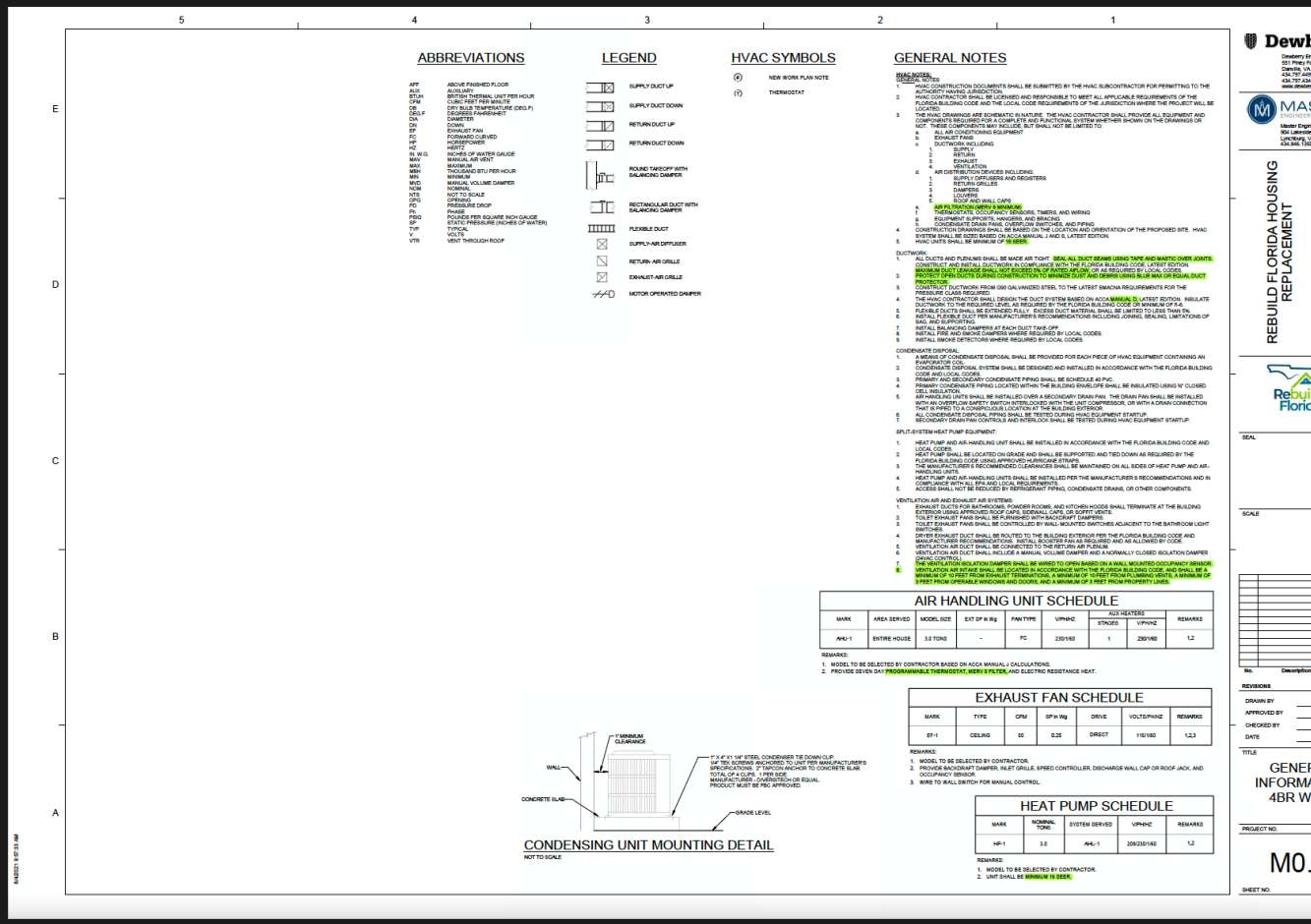
FGBC Energy



ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AUX	AUXILIARY
BTUH	BRITISH THERMAL UNIT PER HOUR
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB TEMPERATURE (DEG.F)
DEG.F	DEGREES FAHRENHEIT
DIA	DIAMETER
DN	DOWN
EF	EXHAUST FAN
FD	FORWARD CURVED
HP	HORSEPOWER
HZ	HERTZ
IN. W.G.	INCHES OF WATER GAUGE
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MIN	MINIMUM
MVD	MANUAL VOLUME DAMPER
NOM	NOMINAL
NTS	NOT TO SCALE
OPG	OPENING
PD	PRESSURE DROP
PH	PHASE
PSIG	POUNDS PER SQUARE INCH GAUGE
SP	STATIC PRESSURE (INCHES OF WATER)
TYP	TYPICAL
V	VOLTS
VTR	VENT THROUGH ROOF

LEGEND

- SUPPLY DUCT UP
- SUPPLY DUCT DOWN
- RETURN DUCT UP
- RETURN DUCT DOWN
- ROUND TAKEOFF WITH BALANCING DAMPER
- RECTANGULAR DUCT WITH BALANCING DAMPER
- FLEXIBLE DUCT
- SUPPLY AIR DIFFUSER
- RETURN AIR GRILLE
- EXHAUST AIR GRILLE
- MOTOR OPERATED DAMPER

HVAC SYMBOLS

- NEW WORK PLAN NOTE
- THERMOSTAT

GENERAL NOTES

HVAC NOTES:
GENERAL NOTES

1. HVAC CONSTRUCTION DOCUMENTS SHALL BE SUBMITTED BY THE HVAC SUBCONTRACTOR FOR PERMITTING TO THE AUTHORITY HAVING JURISDICTION.
2. HVAC CONTRACTOR SHALL BE LICENSED AND RESPONSIBLE TO MEET ALL APPLICABLE REQUIREMENTS OF THE FLORIDA BUILDING CODE AND THE LOCAL CODE REQUIREMENTS OF THE JURISDICTION WHERE THE PROJECT WILL BE LOCATED.
3. THE HVAC DRAWINGS ARE SCHEMATIC IN NATURE. THE HVAC CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND COMPONENTS REQUIRED FOR A COMPLETE AND FUNCTIONAL SYSTEM WHETHER SHOWN ON THE DRAWINGS OR NOT. THESE COMPONENTS MAY INCLUDE, BUT SHALL NOT BE LIMITED TO:
   a. ALL AIR CONDITIONING EQUIPMENT
   b. EXHAUST FANS
   c. DUCTWORK IN BUILDING
      1. SUPPLY
      2. RETURN
      3. EXHAUST
      4. VENTILATION
   d. AIR DISTRIBUTION DEVICES INCLUDING:
      1. DIFFUSERS
      2. RETURN GRILLES
      3. DAMPERS
      4. LOUVERS
      5. ROOF AND WALL CAPS
   e. AIR FILTRATION (MERV 8 MINIMUM)
   f. CONTROLS INCLUDING THERMOSTATS, SENSORS, TIMERS, AND WIRING
   g. EQUIPMENT SUPPORTS, HANGERS, AND BRACING
   h. CONDENSATE DRAIN PANS, OVERFLOW SWITCHES, AND PIPING
4. CONSTRUCTION DRAWINGS SHALL BE BASED ON THE LOCATION AND ORIENTATION OF THE PROPOSED SITE. HVAC SYSTEM SHALL BE SIZED BASED ON ACCA MANUAL J AND S, LATEST EDITION.
5. HVAC UNITS SHALL BE MINIMUM OF 16 SEER.

DUCTWORK:
1. ALL DUCTS AND PLENUMS SHALL BE MADE AIR TIGHT. SEAL ALL DUCT SEAMS USING TAPE AND MASTIC OVER JOINTS. CONSTRUCT AND INSTALL DUCTWORK IN COMPLIANCE WITH THE FLORIDA BUILDING CODE, LATEST EDITION. MAXIMUM DUCT LEAKAGE SHALL NOT EXCEED 5% OF RATED AIR FLOW, OR AS REQUIRED BY LOCAL CODES.
2. PROTECT OPEN DUCTS DURING CONSTRUCTION TO MINIMIZE DUST AND DEBRIS USING BLUE MAX OR EQUAL DUCT PROTECTOR.
3. CONSTRUCT DUCTWORK FROM G90 GALVANIZED STEEL TO THE LATEST SMACNA REQUIREMENTS FOR THE PRESSURE CLASS REQUIRED.
4. THE HVAC CONTRACTOR SHALL DESIGN THE DUCT SYSTEM BASED ON ACCA MANUAL D, LATEST EDITION. INSULATE DUCTWORK TO THE REQUIRED LEVEL AS REQUIRED BY THE FLORIDA BUILDING CODE OR MINIMUM OF R-6.
5. FLEXIBLE DUCTS SHALL BE EXTENDED FULLY. EXCESS DUCT MATERIAL SHALL BE LIMITED TO LESS THAN 5%.
6. INSTALL FLEXIBLE DUCT PER MANUFACTURER'S RECOMMENDATIONS INCLUDING JOINING, SEALING, LIMITATIONS OF RUN AND BENDS.
7. INSTALL BALANCING DAMPERS AT EACH DUCT TAKE-OFF.
8. INSTALL FIRE AND SMOKE DAMPERS WHERE REQUIRED BY LOCAL CODES.
9. INSTALL SMOKE DETECTORS WHERE REQUIRED BY LOCAL CODES.

CONDENSATE DISPOSAL:
1. A MEANS OF CONDENSATE DISPOSAL SHALL BE PROVIDED FOR EACH PIECE OF HVAC EQUIPMENT CONTAINING AN EVAPORATOR COIL.
2. CONDENSATE DISPOSAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE AND LOCAL CODES.
3. PRIMARY AND SECONDARY CONDENSATE PIPING SHALL BE SCHEDULE 40 PVC.
4. PRIMARY CONDENSATE PIPING LOCATED WITHIN THE BUILDING ENVELOPE SHALL BE INSULATED USING ¾" CLOSED CELL FOAM.
5. AIR HANDLING UNITS SHALL BE INSTALLED OVER A SECONDARY DRAIN PAN. THE DRAIN PAN SHALL BE INSTALLED WITH AN OVERFLOW SAFETY SWITCH INTERLOCKED WITH THE UNIT COMPRESSOR, OR WITH A DRAIN CONNECTION THAT IS PIPED TO A CONSPICUOUS LOCATION AT THE BUILDING EXTERIOR.
6. ALL CONDENSATE DISPOSAL PIPING SHALL BE TESTED DURING HVAC EQUIPMENT STARTUP.
7. SECONDARY DRAIN PAN CONTROLS AND INTERLOCK SHALL BE TESTED DURING HVAC EQUIPMENT STARTUP.

SPLIT-SYSTEM HEAT PUMP EQUIPMENT:
1. HEAT PUMP AND AIR-HANDLING UNIT SHALL BE INSTALLED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE AND LOCAL CODES.
2. HEAT PUMP SHALL BE LOCATED ON GRADE AND SHALL BE SUPPORTED AND TIED DOWN AS REQUIRED BY THE FLORIDA BUILDING CODE AND MANUFACTURER RECOMMENDATIONS.
3. THE MANUFACTURER'S RECOMMENDED CLEARANCES SHALL BE MAINTAINED ON ALL SIDES OF HEAT PUMP AND AIR-HANDLING UNITS.
4. HEAT PUMP AND AIR-HANDLING UNITS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH ALL EPA AND LOCAL REQUIREMENTS.
5. ACCESS SHALL NOT BE REDUCED BY REFRIGERANT PIPING, CONDENSATE DRAINS, OR OTHER COMPONENTS.

VENTILATION AIR AND EXHAUST AIR SYSTEMS:
1. EXHAUST DUCTS FOR BATHROOMS, POWDER ROOMS, AND KITCHEN HOODS SHALL TERMINATE AT THE BUILDING EXTERIOR USING APPROVED ROOF CAPS, SIDEWALL CAPS, OR SOFFIT VENTS.
2. TOILET EXHAUST FANS SHALL BE FURNISHED WITH BACKDRAFT DAMPERS.
3. TOILET EXHAUST FANS SHALL BE CONTROLLED BY WALL-MOUNTED SWITCHES ADJACENT TO THE BATHROOM LIGHT SWITCH.
4. DRYER EXHAUST DUCT SHALL BE ROUTED TO THE BUILDING EXTERIOR PER THE FLORIDA BUILDING CODE AND MANUFACTURER RECOMMENDATIONS. INSTALL BOOSTER FAN AS REQUIRED AND AS ALLOWED BY CODE.
5. VENTILATION AIR DUCT SHALL BE CONNECTED TO THE RETURN AIR PLENUM.
6. VENTILATION AIR DUCT SHALL INCLUDE A MANUAL VOLUME DAMPER AND A NORMALLY CLOSED ISOLATION DAMPER (HVAC CONTROL).
7. VENTILATION ISOLATION DAMPER SHALL BE WIRED TO BE OPEN BASED ON A WALL-MOUNTED OCCUPANCY SENSOR.
8. VENTILATION AIR INTAKE SHALL BE LOCATED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE, AND SHALL BE A MINIMUM OF 10 FEET FROM EXHAUST TERMINATIONS, A MINIMUM OF 10 FEET FROM PLUMBING VENTS, A MINIMUM OF 3 FEET FROM OPERABLE WINDOWS AND DOORS, AND A MINIMUM OF 3 FEET FROM PROPERTY LINES.

AIR HANDLING UNIT SCHEDULE

MARK	AREA SERVED	MODEL SIZE	EXT SP in Wg	FAN TYPE	V/PH/HZ	AUX HEATERS STAGES	AUX HEATERS V/PH/HZ	REMARKS
AHU-1	ENTIRE HOUSE	3.0 TONS	-	FC	230/1/60	1	230/1/60	1,2

REMARKS:
1. MODEL TO BE SELECTED BY CONTRACTOR BASED ON ACCA MANUAL J CALCULATIONS.
2. PROVIDE SEVEN DAY PROGRAMMABLE THERMOSTAT, MERV 8 FILTER, AND ELECTRIC RESISTANCE HEAT.

EXHAUST FAN SCHEDULE

MARK	TYPE	CFM	SP in Wg	DRIVE	VOLTS/PH/HZ	REMARKS
EF-1	CEILING	50	0.25	DIRECT	115/1/60	1,2,3

REMARKS:
1. MODEL TO BE SELECTED BY CONTRACTOR.
2. PROVIDE BACKDRAFT DAMPER, INLET GRILLE, SPEED CONTROLLER, DISCHARGE WALL CAP OR ROOF JACK, AND OCCUPANCY SENSOR.
3. WIRE TO WALL SWITCH FOR MANUAL CONTROL.

HEAT PUMP SCHEDULE

MARK	NOMINAL TONS	SYSTEM SERVED	V/PH/HZ	REMARKS
HP-1	3.0	AHU-1	208/230/1/60	1,2

REMARKS:
1. MODEL TO BE SELECTED BY CONTRACTOR.
2. UNIT SHALL BE MINIMUM 16 SEER.

CONDENSING UNIT MOUNTING DETAIL

NOT TO SCALE

Dewberry
Dewberry Engineers Inc.
551 Piney Forest Road
Danville, VA 24540
434.797.4300 Phone
434.797.4341 Fax
www.dewberry.com

MASTER ENGINEERS & DESIGNERS
Master Engineers & Designers
904 Lakeside Drive
Lynchburg, VA 24501
434.845.1366

REBUILD FLORIDA HOUSING REPLACEMENT
FLORIDA
PRELIMINARY DOCUMENTS

Rebuild Florida

SEAL

SCALE

No.	Description	Date

REVISIONS

DRAWN BY	WJC
APPROVED BY	CNB
CHECKED BY	CNB
DATE	JUNE 4, 2021

TITLE
GENERAL INFORMATION 4BR WIDE

PROJECT NO. 92136116

M0.1

SHEET NO.

DUCTWORK:
1. ALL DUCTS AND PLENUMS SHALL BE MADE AIR TIGHT. SEAL ALL DUCT SEAMS USING TAPE AND MASTIC OVER JOINTS. CONSTRUCT AND INSTALL DUCTWORK IN COMPLIANCE WITH THE FLORIDA BUILDING CODE, LATEST EDITION. MAXIMUM DUCT LEAKAGE SHALL NOT EXCEED 5% OF RATED AIFLOW, OR AS REQUIRED BY LOCAL CODES.
2. PROTECT OPEN DUCTS DURING CONSTRUCTION TO MINIMIZE DUST AND DEBRIS USING BLUE MAX OR EQUAL DUCT PROTECTOR.

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Blue is the New Green

Water Conservation

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Florida Reality

- US Average: 100 Gallons/person/day
- Florida average water use = 125 gallons/person/day
- Florida's High = 174 gallons/person/day
- Water needed for drinking, cooking, bathing, and sanitation = 13 gallons/day

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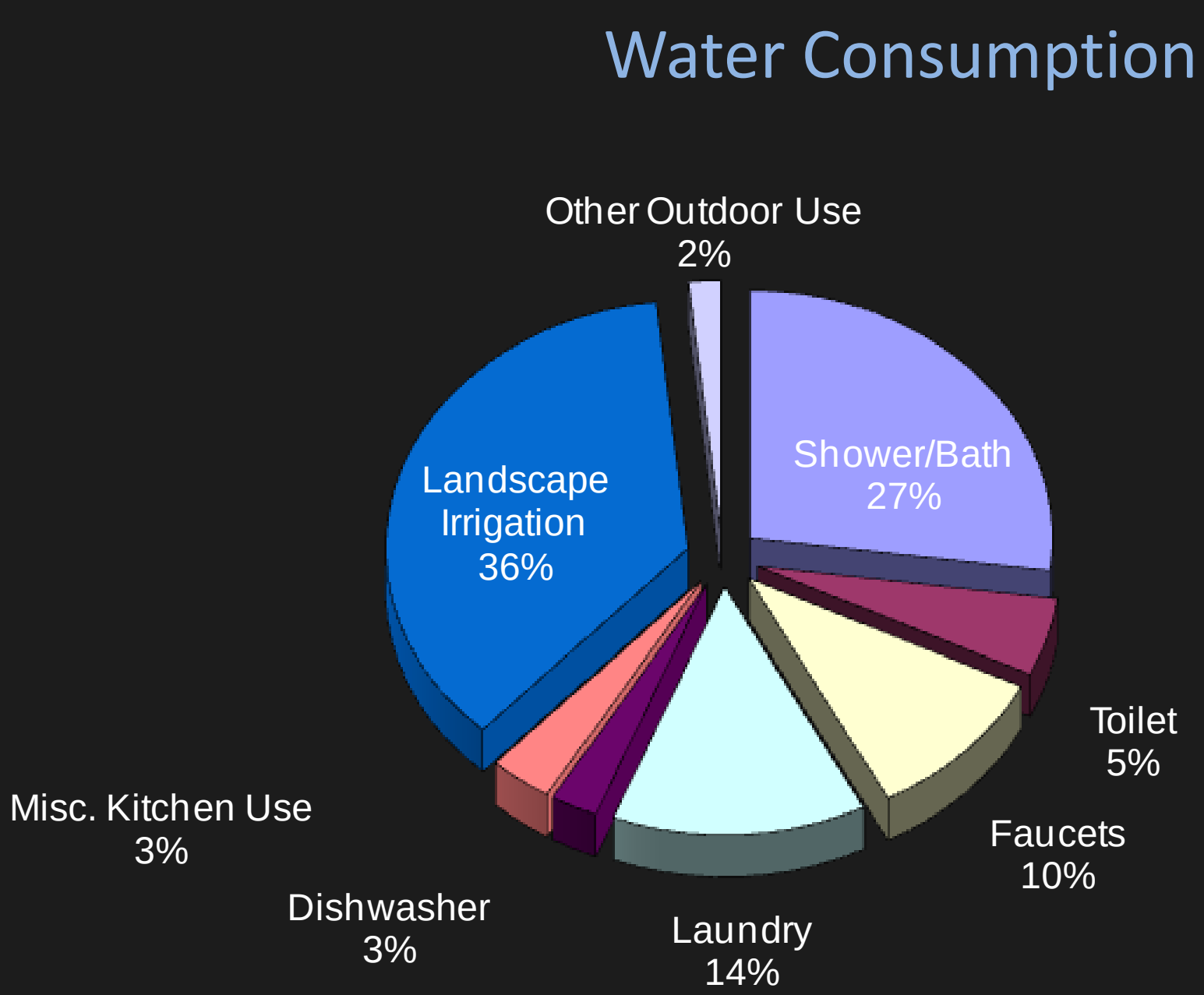
Water Consumption



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Well it’s Landscaped

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Landscaped Well

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Drought Tolerant Vegetation

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Soil Moisture Sensor Control

>50% Decrease in Irrigation

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Flow Rates

EPA Policy 1991	
Showers: 2.5 gpm	2.0 gpm
Toilets 1.6 gpf	1.28 gpf (≥350 MaP)
Faucets: 2.5	1.5 gpm

Prior to 1991, 3.5 or 7.0 gpf common

Shower: As low as 1.5gpm
WC: Dual Flush, 1.1. 0.8 gpf
Lav: 0.5 gpm

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Next Generation

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Low Flow

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Install Water Saving Toilets

MaP
Maximum Performance

MaP Scoring Guide

Highly Recommended	Recommended	Acceptable	Not Recommended
Great Flushing Performance	Strong Flushing Performance	Minimum	Poor Flushing Performance
1,000g-600g	600g-350g	350g-250g	250g-0g

Weight Equivalents: 1,000g = 35 ounces | 600g = 21 ounces | 350g = 12 ounces

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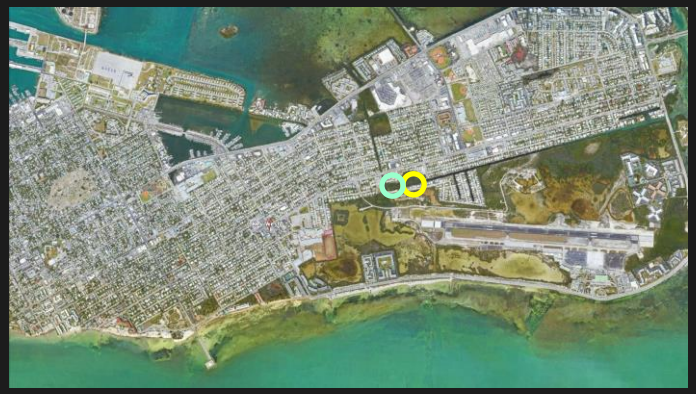
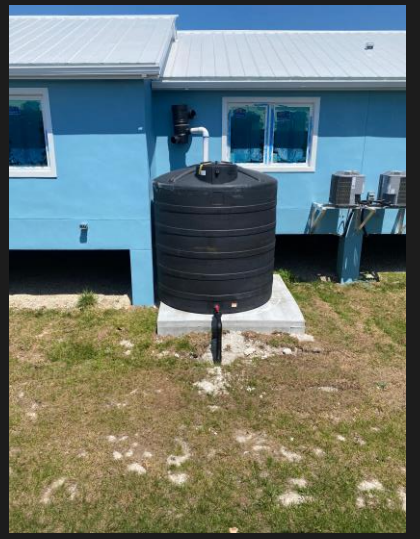
Cistern - Rainwater Harvesting





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ZEH

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Back in the Day Cistern

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Integrated Cistern

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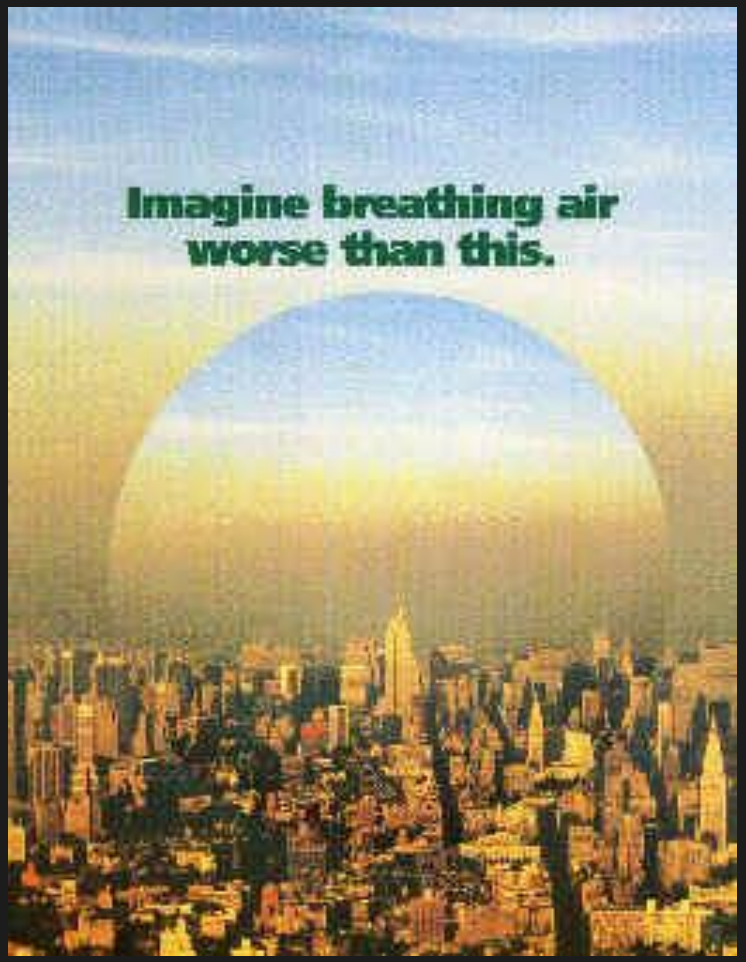
Indoor Environmental Quality

- Healthy indoor environmental
- Air
- Lighting
- Thermal comfort
- Moisture control



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Proper Pressure Balance

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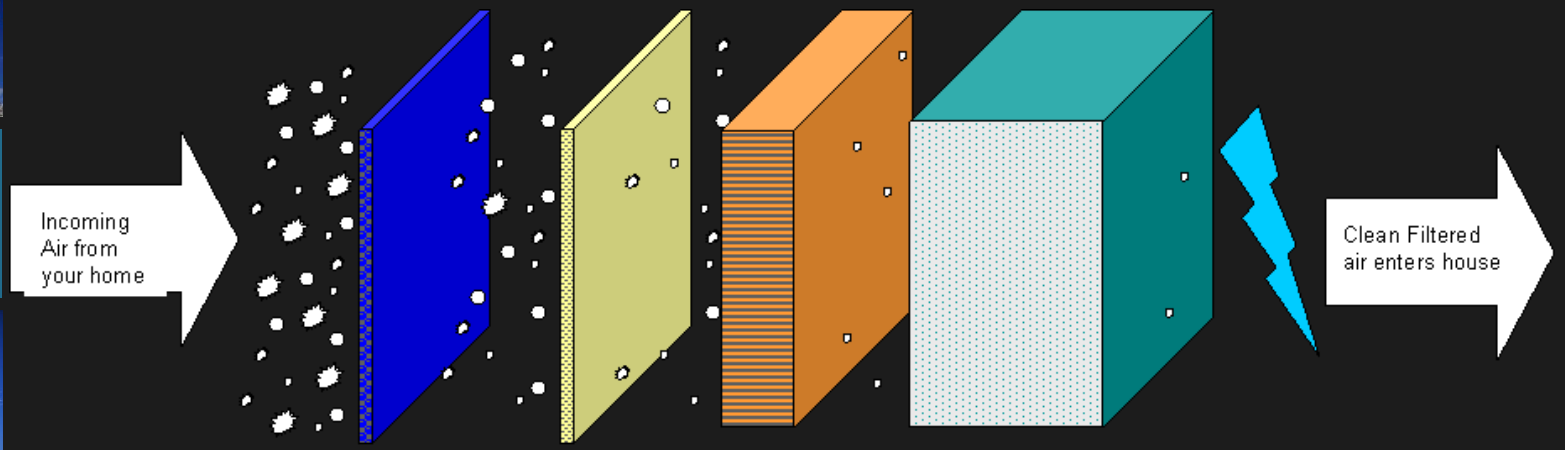
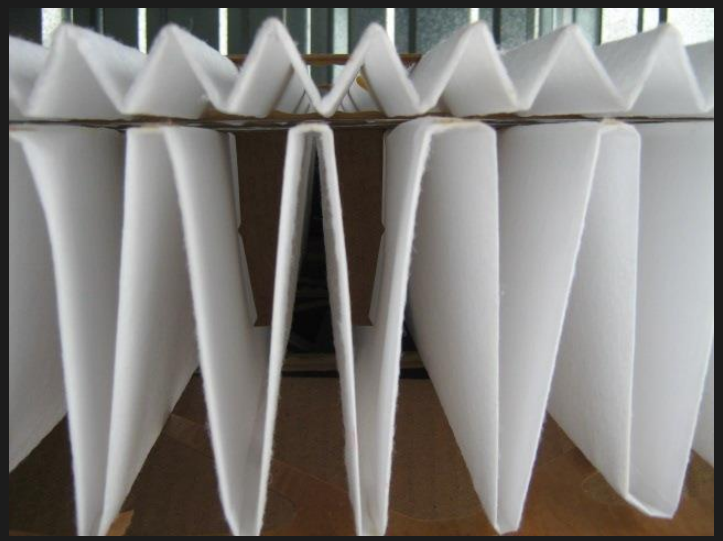
Filters





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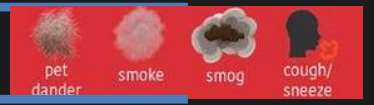
Minimum Efficiency Rating Value

MERV Rating Chart

MERV Rating:	0.3-1.0 µm	1.0-3.0 µm	3.0-10.0 µm
MERV 1	Under 20%	Under 20%	Under 20%
MERV 2	Under 20%	Under 20%	Under 20%
MERV 3	Under 20%	Under 20%	Under 20%
MERV 4	Under 20%	Under 20%	Under 20%
MERV 5	Under 20%	Under 20%	20% - 34%
MERV 6	Under 20%	Under 20%	35% - 49%
MERV 7	Under 20%	Under 20%	50% - 69%
MERV 8	Under 20%	Under 20%	70% - 85%
MERV 9	Under 20%	Under 50%	Above 85%
MERV 10	Under 20%	50% - 64%	Above 85%
MERV 11	Under 20%	65% - 79%	Above 85%
MERV 12	Under 20%	80% - 90%	Above 90%
MERV 13	Under 75%	Above 90%	Above 90%
MERV 14	75% - 84%	Above 90%	Above 90%
MERV 15	85% - 94%	Above 95%	Above 90%
MERV 16	Above 95%	Above 95%	Above 90%
MERV 17	99.97%	Above 99%	Above 99%
MERV 18	99.997%	Above 99%	Above 99%
MERV 19	99.9997%	Above 99%	Above 99%
MERV 20	99.99997%	Above 99%	Above 99%



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Materials Selection

- Select materials with lowest possible environmental impact
- Renewable
- Sustainable
- Durability
- Recyclability
- Recycled content materials
- Purchase local materials
- Engineered products

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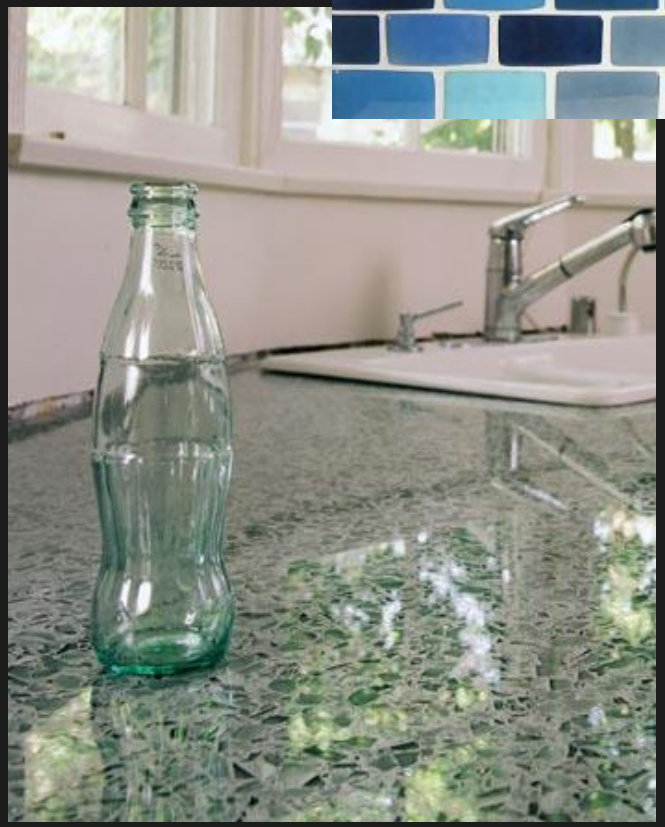
100% Recycled Glass Tile



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Bamboo Flooring

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Bamboo Flooring

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Global Economy

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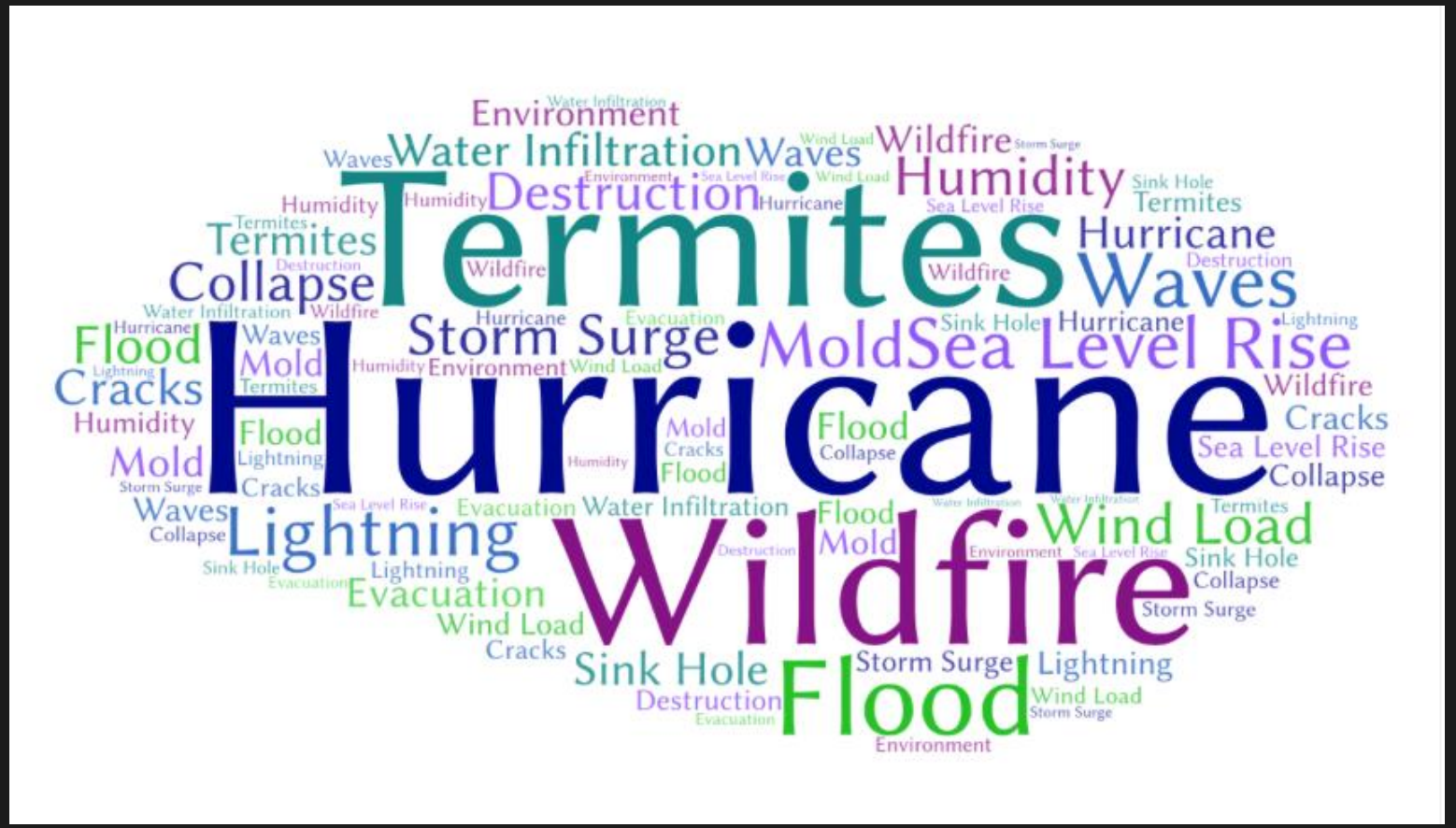
Environment
Water Infiltration
Waves
Water Infiltration
Waves
Wildfire
Humidity
Destruction
Termites
Termites
Hurricane
Collapse
Termites
Waves
Wildfire
Wildfire
Hurricane
Storm Surge
Mold
Sea Level Rise
Flood
Waves
Mold
Cracks
Hurricane
Wildfire
Cracks
Humidity
Flood
Lightning
Mold
Storm Surge
Cracks
Waves
Collapse
Lightning
Sea Level Rise
Evacuation
Water Infiltration
Wind Load
Mold
Environment
Sink Hole
Collapse
Storm Surge
Evacuation
Wind Load
Cracks
Sink Hole
Storm Surge
Lightning
Destruction
Flood
Wind Load
Environment

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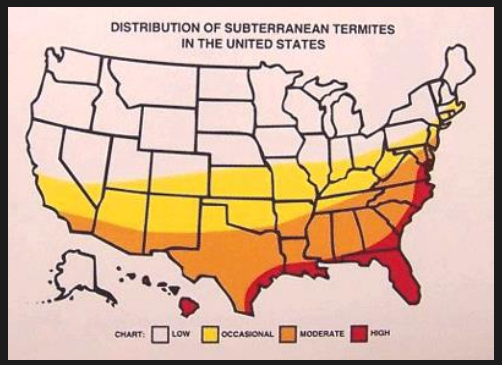
Natural Disasters



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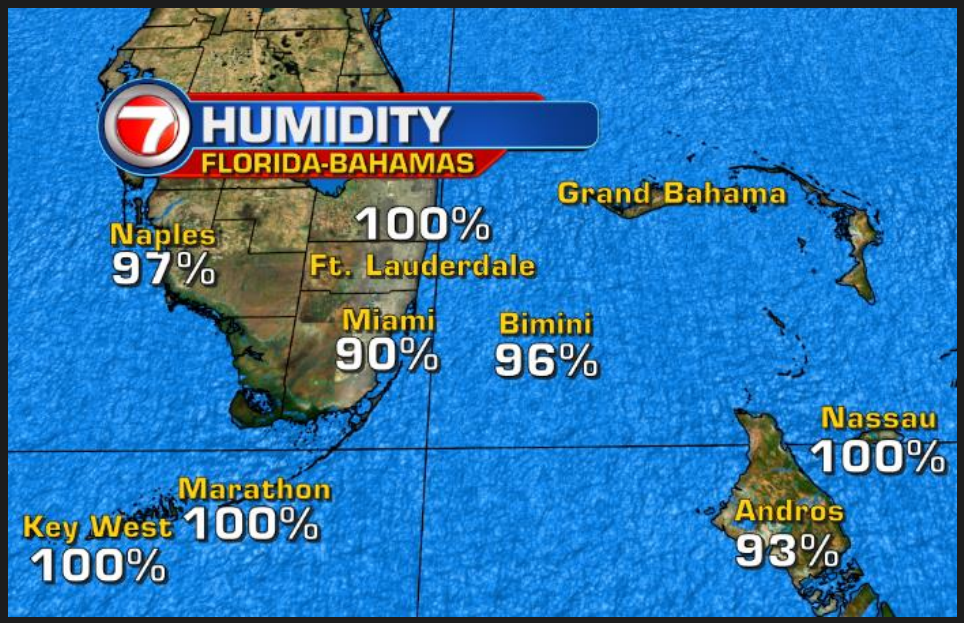
Our Biggest Issue - Moisture

- Bulk Moisture
- Ambient Moistures
  - Deflect, Drain, Dry
  - Durability, Doability



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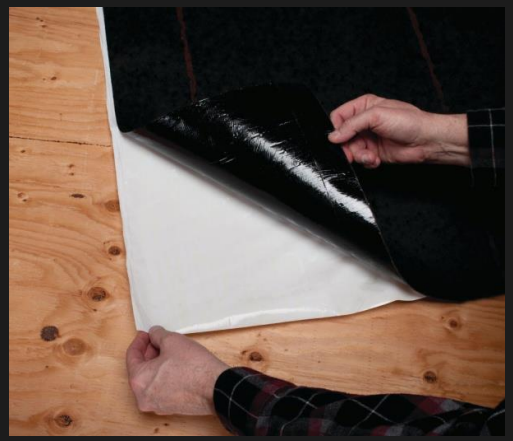
Keep it Dry



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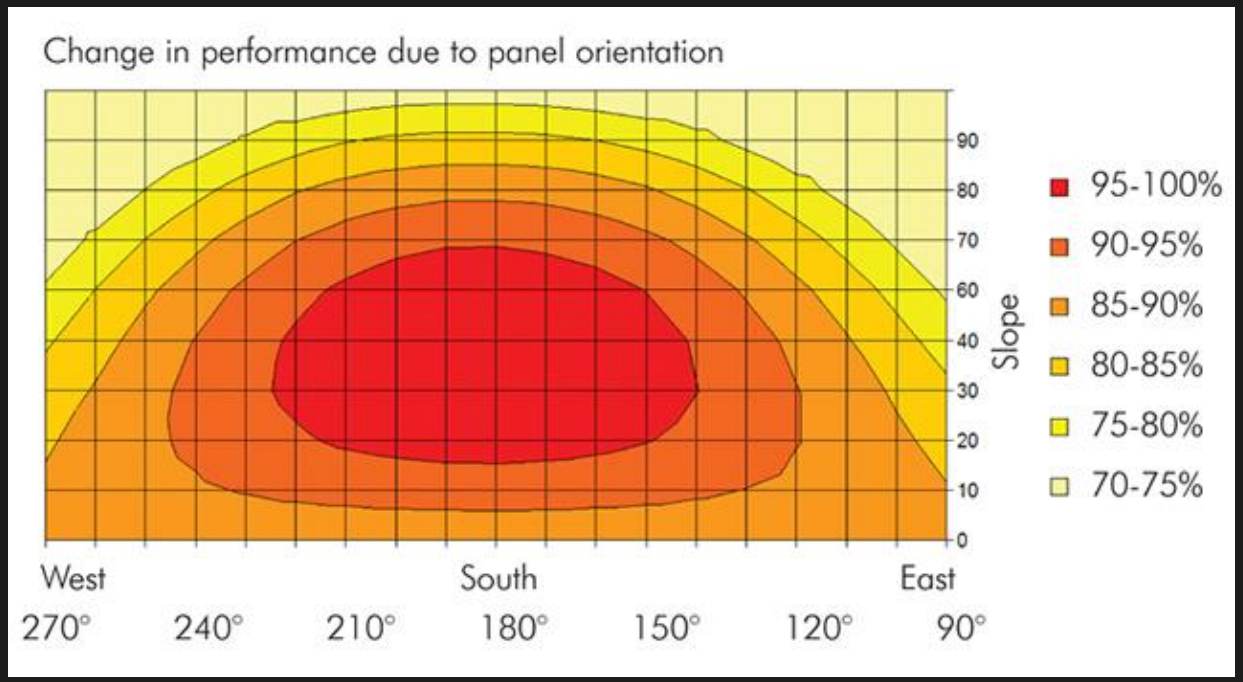
Solar Ready Design

- Basics
  - Zoning, LDS, Utilities
  - Shade
  - Home Orientation
  - Roof Slope



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Green Retrofit

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Assessment

- Age of Home
- Number and age of occupants
- Water Consumption
- Energy Consumption
- “Walk Through”
- Budget

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Energy

FLORIDA GREEN BUILDING COALITION

Green Home Retrofit

Level 1

Energy

Education

Water

- Window Tint
- Attic Insulation
- CFL or LED Bulbs
- Energy Star Appliances
- Programmable Thermostat
- Gasket Outlets
- Radiant Barrier
- Light Color Exterior Repaint
- Efficient Hot Water & timers
- Motion Sensors
- Weatherization

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Water

- Rain Gauge
- Programmable Controller
- Replace Turf with FFL
- Rain Barrels
- Pool Covers
- Abandon Irrigation
- Professional Irrigation check

- Reinforced Hoses
- Low Flow Shower Heads
- Aerators
- Energy Star Washer
- Energy Star Dryer
- Low Flow Toilets

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Green Remodel

Home Built
1974
Alva FL

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Green Remodel

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Green Remodel

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Before

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After

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Landscape After

Before

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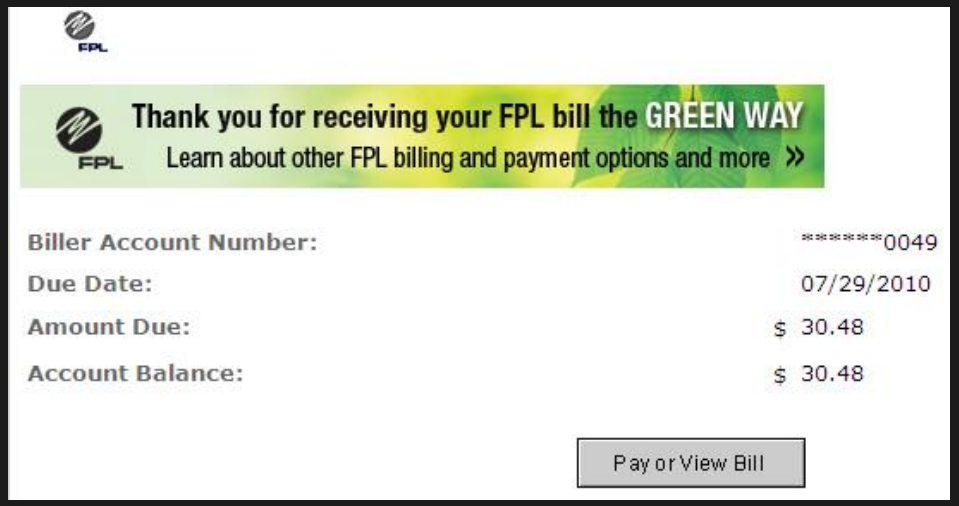
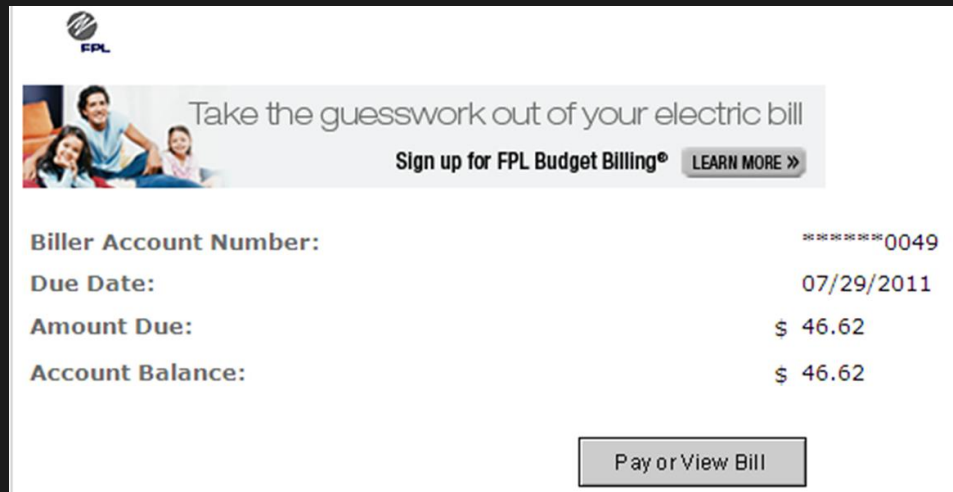
Home Improvement

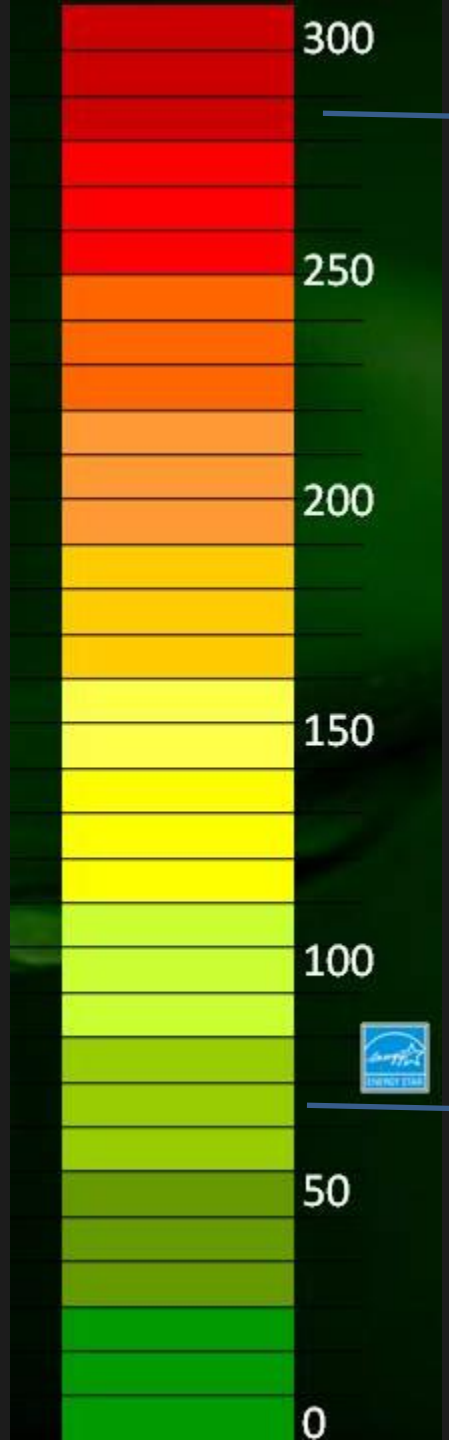
Improve House to Code: $9,000

Efficiency Improvements above Code: $7,500

Eye Candy Improvements: cork, granite, travertine,…







Jens House
BEFORE

Jens House
AFTER

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Davis Street

SEER 8
R-11 Ceiling
R-1 Walls
Windows U=1.2, SHGC=0.7
Electric Hot water
Incandescent bulbs

SEER 15
R-38 Ceiling
R-8 Walls
Ducts & AH in Interior
Windows U=0.65 SHGC=0.4
Solar Hot Water
80% CFL lighting

2181 SF

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Davis Street

2500 Davis Street, Fort Myers Florida

House Size 2181		HERS Index	Annual Energy Cost To Homeowner
Exiting	SEER 8, R-11 ceiling, CMU Exterior Walls R-1, Single Hung clear (U=1.2 SHGC=0.70), Non-Programmable Thermostat, HW None, Ducts-attic, AH-Attic	168	$ 2,223.00
Existing + Specs	**SEER 15**, **improve insulation to R-38 ceiling**, **Radiant Barrier**, CMU Exterior Walls R-1, **Single Hung tinted windows (U ≤ .65, SHGC ≤ .40), Programmable Thermostat, HW EF > 0.93,** Ducts-attic (**leak free ducts**), **AH-Interior(conditioned), Energy Star Appliances (Clothes Washer, Refrigerator, Dish Washer**), **Energy Efficient oven/range, clothes dryer, 80% CFL lighting**	74	$ 1,205.00
Recommended improved envelope and equipment	SEER 15, improve insulation to R-38 ceiling, Radiant Barrier, **CMU Exterior Walls R-8**, Single Hung tinted windows (U ≤ .65, SHGC ≤ .40), Programmable Thermostat, Ducts-attic (leak free ducts), AH-Interior(conditioned), Energy Star Appliances (Clothes Washer, Refrigerator, Dish Washer), Energy Efficient oven/range, clothes dryer, 80% CFL lighting, **Solar Hot Water heater**	58	$ 936.00

$3,200	SEER 15
$ 600	R-38 Ceiling
$1,100	R-8 Walls
$6,000	Windows U=0.65 SHGC=0.4
$4,200	Solar Hot Water
$ 60	80% CFL lighting

Efficiency Remodel Cost $15,760

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Davis Street

Remodel Cost $15,760
Energy Reductio: 11,961 kWh

9 kW Photovoltaic System
$25,500

To have the same energy savings as $15,760 in conservation renovation

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www.trifectaconstruction.com

Jennifer@trifectaconstruction.com

(239) 229 - 3177

Dr. Jennifer Languell

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Next Week's Training

The Upcoming Atlantic Hurricane Season

Dr. Phil Klotzbach, Dept. of Atmospheric Science, Colorado State University

March 4 at 1:30 pm

Register at

https://attendee.gotowebinar.com/register/2517142076486684174

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Thank You!

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Michael Chaney
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