



Enhancing Inspections with Digital Data Collection



DOE National Energy Codes Conference 2018

July 17, 2018

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Implementation Manager

U.S. EPA, ENERGY STAR Residential Branch



ENERGY STAR™ Certified Homes

- 10-15% more efficient than typical new homes
- Designed and built to high standards
- Inspected, tested and verified by HERS Raters, a.k.a. ERI Raters





ENERGY STAR and Code



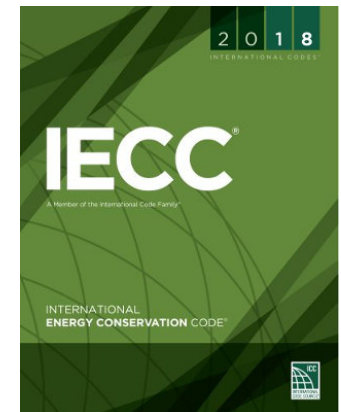
(aka "ERI")



Mandatory
ENERGY STAR
Requirements

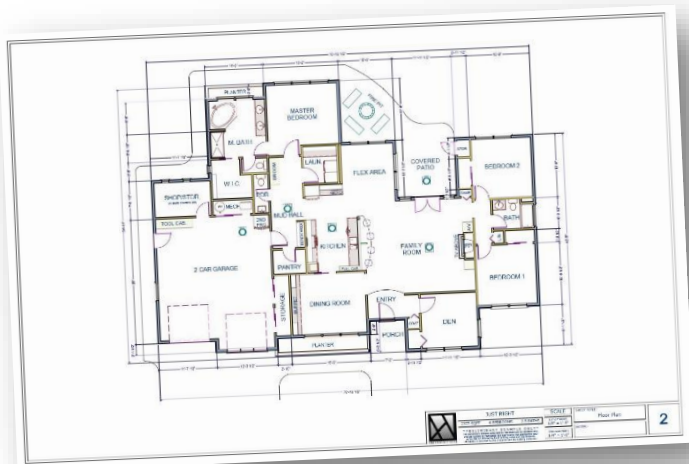


Mandatory
IECC
Requirements

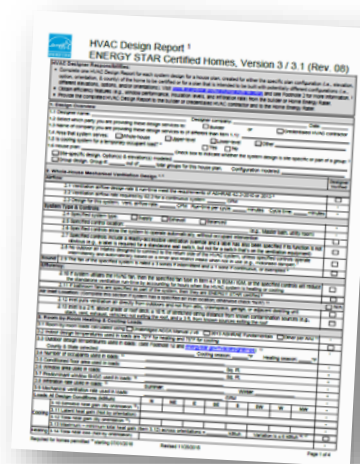


Current Rater Workflow

Collect house plans and design documents and perform preliminary energy modeling.

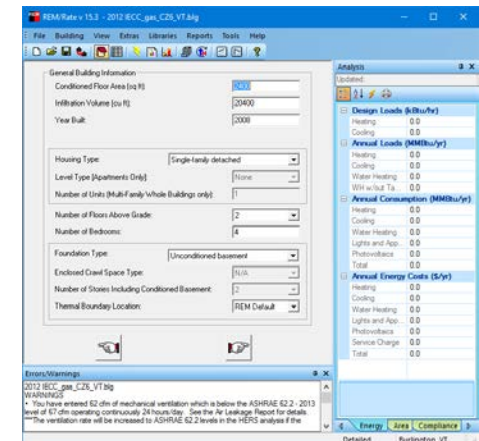


House Plans



Design Documentation

5



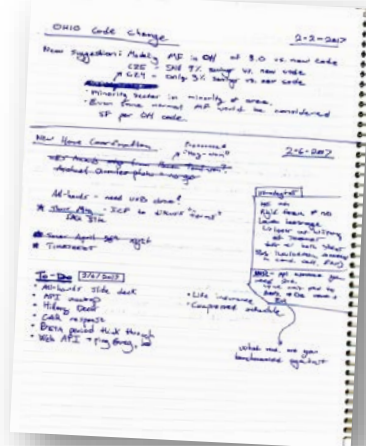
Energy Modeling

Current Rater Workflow

Perform two site inspections at pre-drywall and final construction phases



Field
Checklists



Field Notes



Photos



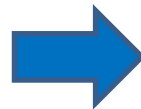
Test Results

Current Rater Workflow

Finalize energy model, send to internal QA and make final submission



Checklists +
Notes



Final Energy
Model

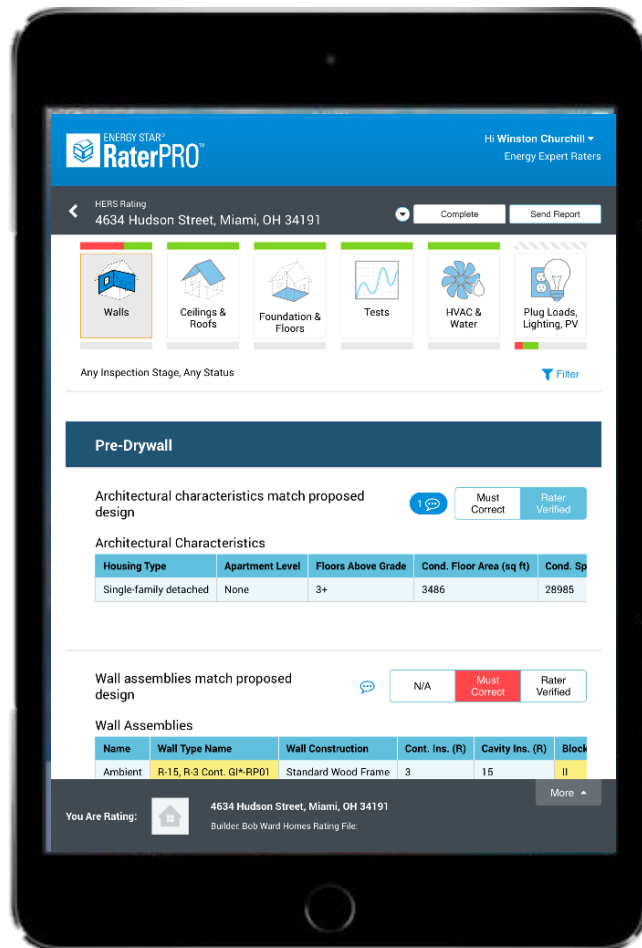


Quality
Assurance
Review

&

Final
Submission

Introducing ENERGY STAR™ RaterPRO





Key Features of RaterPRO

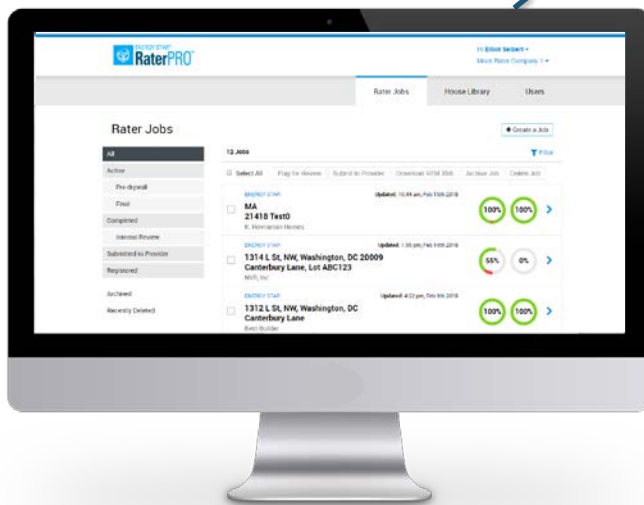
1. Ability to verify both ENERGY STAR and HERS (ERI) jobs.



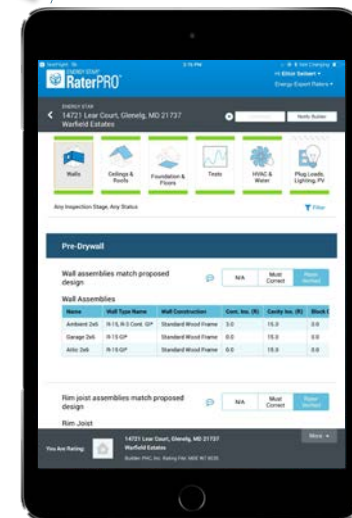
Key Features of RaterPRO

2. Cloud-based, but with the ability to work offline.

Cloud
Hosted



Web-Based Admin Site



Field App

Key Features of RaterPRO

- 3. Able to import proposed ratings from ERI software.
- 4. Able to export confirmed ratings back to ERI software.



Key Features of RaterPRO

5. Capable of capturing robust data.

Status

N/A

Must
Correct

Rater
Verified

Notes

Great job on the wall insulation!

Photos



Key Features of RaterPRO

6. Voluntary and freely available.



ENERGY STAR. The simple choice for energy efficiency.



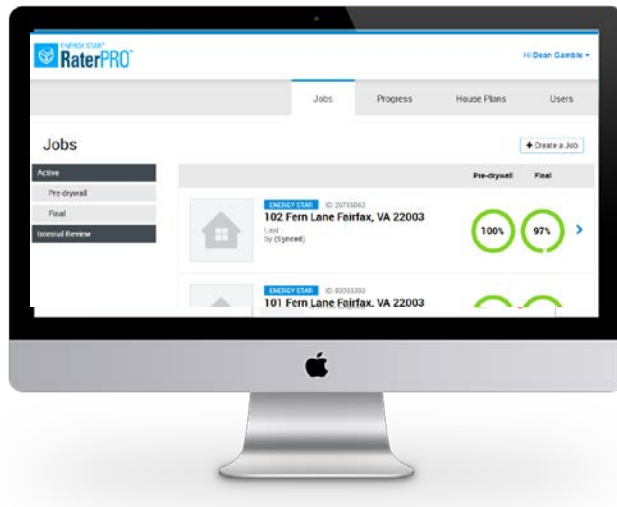


What is a “High Quality Rating”?

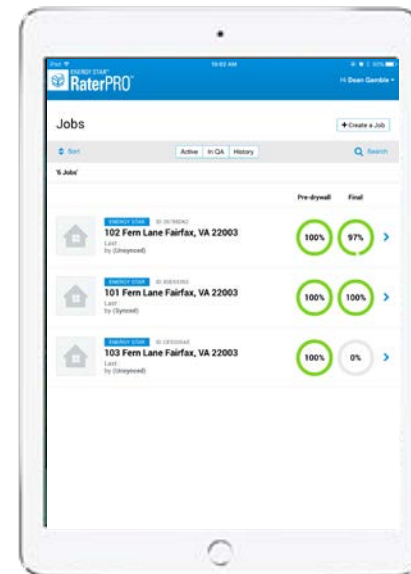
A High-Quality Rating has five features:

1. Rater is (verifiably) present on site
2. Thorough inspection
3. Accurately applies program requirements
4. Well-documented
5. Results in a final energy model that is faithful to the site observations

How RaterPRO Works

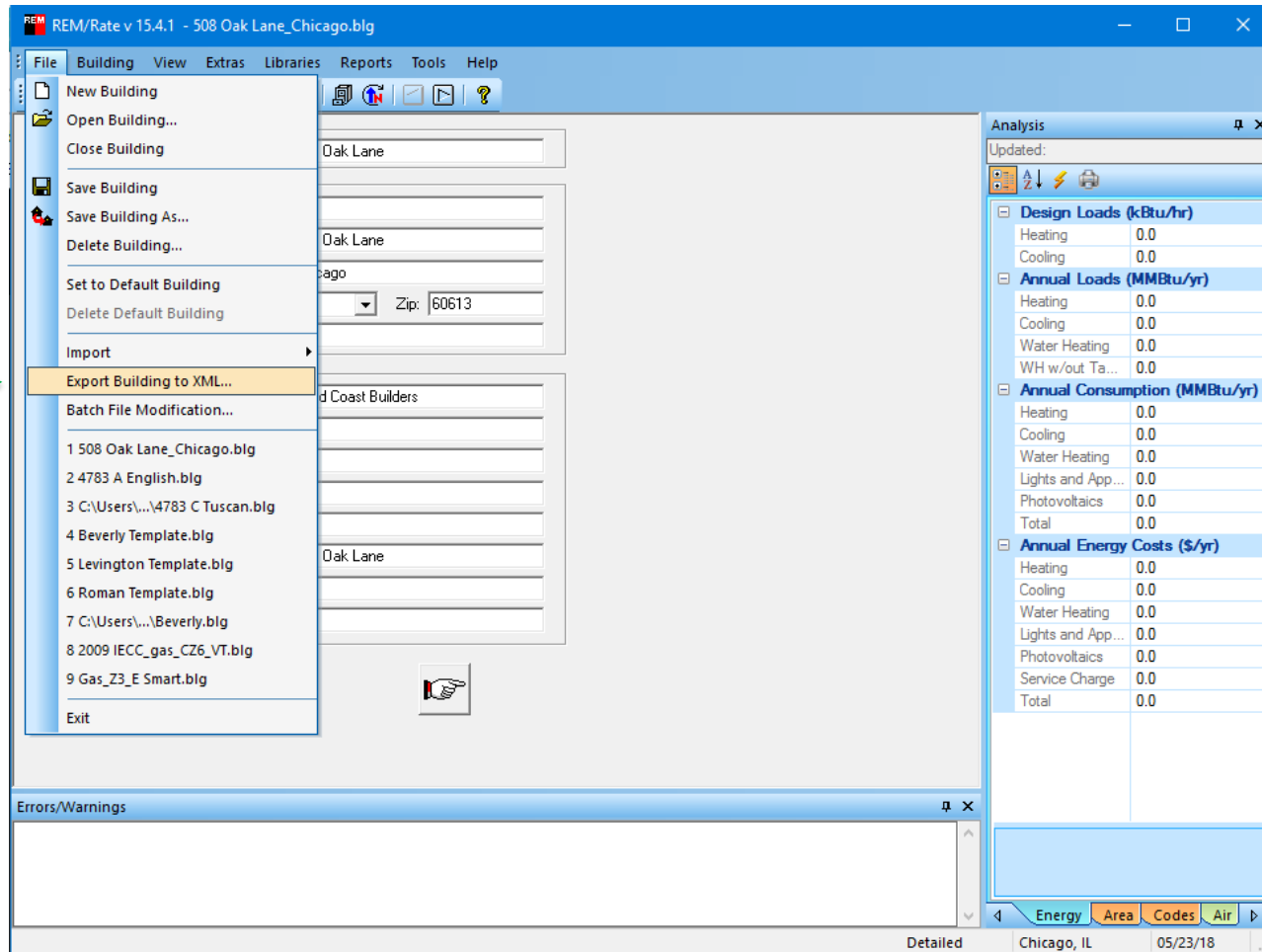


Web-Based Admin Site

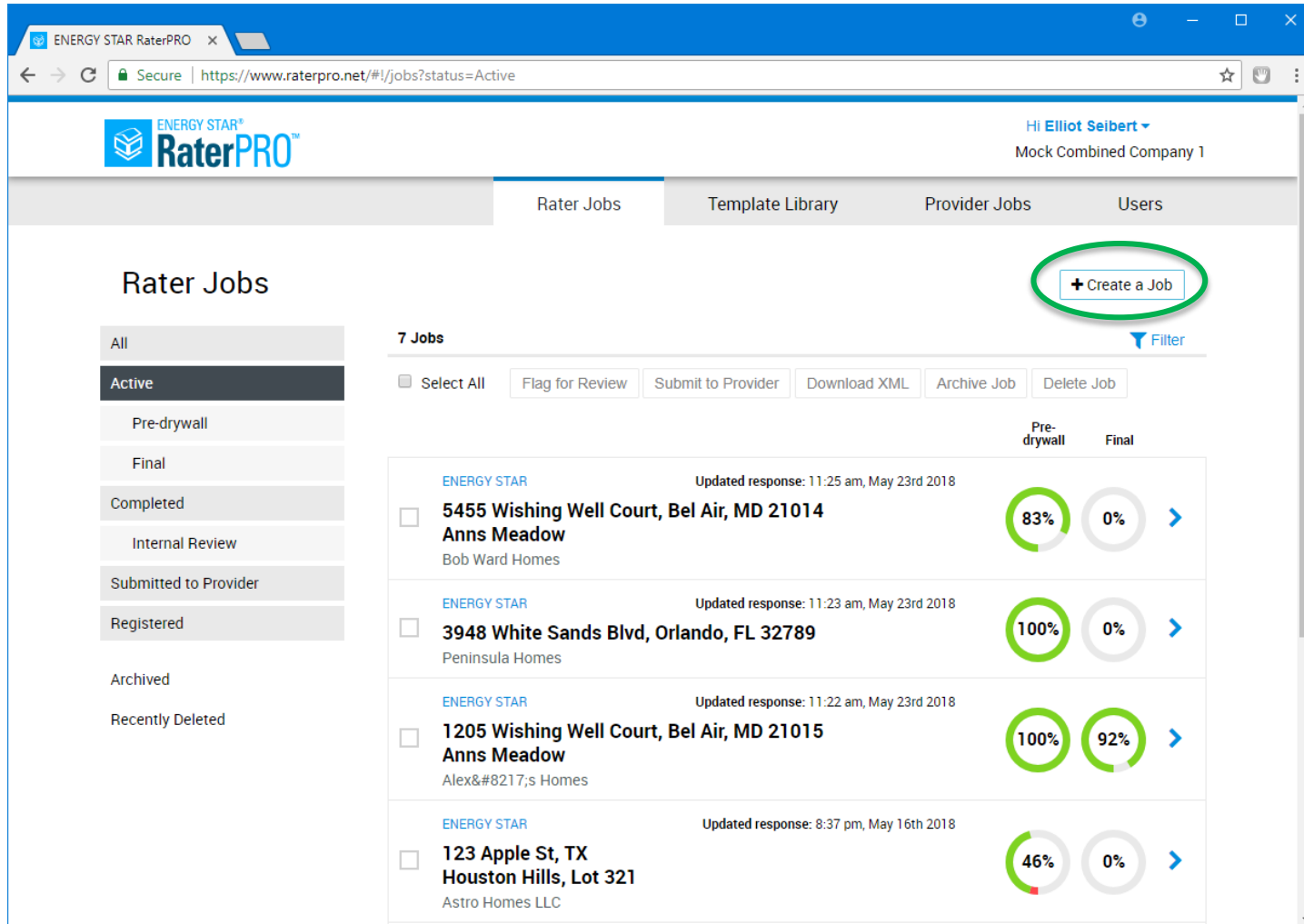


Mobile App

Export Job from REM/Rate



Create a Job



ENERGY STAR RaterPRO

Hi Elliot Seibert ▾
Mock Combined Company 1

Rater Jobs | Template Library | Provider Jobs | Users

Rater Jobs

All
Active
Pre-drywall
Final
Completed
Internal Review
Submitted to Provider
Registered
Archived
Recently Deleted

7 Jobs [Filter](#)

☐ Select All [Flag for Review](#) [Submit to Provider](#) [Download XML](#) [Archive Job](#) [Delete Job](#)

		Pre-drywall	Final	
<input type="checkbox"/>	5455 Wishing Well Court, Bel Air, MD 21014 Anns Meadow Bob Ward Homes	83%	0%	>
<input type="checkbox"/>	3948 White Sands Blvd, Orlando, FL 32789 Peninsula Homes	100%	0%	>
<input type="checkbox"/>	1205 Wishing Well Court, Bel Air, MD 21015 Anns Meadow Alex’s Homes	100%	92%	>
<input type="checkbox"/>	123 Apple St, TX Houston Hills, Lot 321 Astro Homes LLC	46%	0%	>

Mobile App



Job Details

ENERGY STAR[®] **RaterPRO**[™] Hi Winston Churchill ▾
Energy Expert Raters

HERS Rating
4634 Hudson Street, Miami, OH 34191

Complete Send Report

Walls Ceilings & Roofs Foundation & Floors Tests HVAC & Water Plug Loads, Lighting, PV

Any Inspection Stage, Any Status Filter

Pre-Drywall

Architectural characteristics match proposed design 1 Must Correct Rater Verified

Architectural Characteristics

Housing Type	Apartment Level	Floors Above Grade	Cond. Floor Area (sq ft)	Cond. Sp
Single-family detached	None	3+	3486	28985

Wall assemblies match proposed design N/A Must Correct Rater Verified

Wall Assemblies

Name	Wall Type Name	Wall Construction	Cont. Ins. (R)	Cavity Ins. (R)	Block
Ambient	R-15, R-3 Cont. GI*RP01	Standard Wood Frame	3	15	II

You Are Rating: 4634 Hudson Street, Miami, OH 34191
Builder: Bob Ward Homes Rating File: More

Completion percentages

Comments

Status

By area in the house

Minimum rated features and ENERGY STAR Checklist Items

Edit Minimum Rated Feature

Design

HERS Rating
4634 Hudson Street, Miami, OH 34191

Complete Send Report








Windows match proposed design

N/A Must Correct Rater Verified

Windows

Name	Window Type Name	U-Value	SHGC	Area (sq ft)	Orientation	Overhang Depth (ft)
Front	Window .30/.20*	0.300	0.200	South	120.0	0.0
Right	Window .30/.20*	0.300	0.200	East	60.0	0.0
Rear	Window .30/.20*	0.300	0.200	North	114.0	0.0
Left	Window .30/.20*	0.300	0.200	West	30.0	0.0
Left	Slider .28/.22*	0.280	0.220	West	42.0	0.0
Rear	Slider .28/.22*	0.280	0.220	North	42.0	0.0
Rear	Window .40/.28*	0.400	0.280	North	17.0	0.0

Doors match proposed design

N/A Must Correct Rater Verified

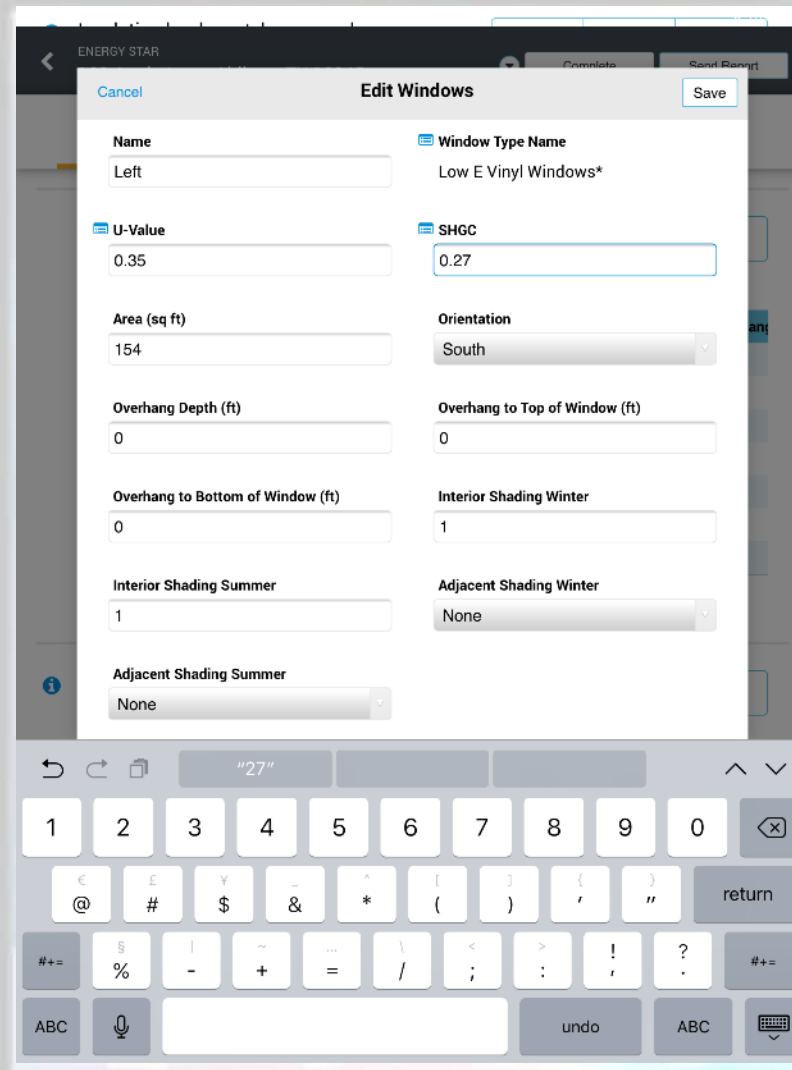
Doors

Name	Door Type Name	R-Value of Opaque Area	Storm Door?	Opaque Area (sq ft)
Front Door	Therma-Tru Fibreglas*	5.30	No	21.0
Garage Door	Steel-urth w/brk	4.40	No	21.0

You Are Rating:  4634 Hudson Street, Miami, OH 34191

Builder: Bob Ward Homes Rating File: More

Edit Minimum Rated Feature



Edit Windows

Name
Left

Window Type Name
Low E Vinyl Windows*

U-Value
0.35

SHGC
0.27

Area (sq ft)
154

Orientation
South

Overhang Depth (ft)
0

Overhang to Top of Window (ft)
0

Overhang to Bottom of Window (ft)
0

Interior Shading Summer
1

Interior Shading Winter
1

Adjacent Shading Summer
None

Adjacent Shading Winter
None

Edit Minimum Rated Feature



ENERGY STAR
123 Apple Lane, Abilene, TX 12345
Complete
Send Report

Windows match proposed design

N/A
Must Correct
Rater Verified

Windows

Name	Window Type Name	U-Value	SHGC	Area (sq ft)	Orientation	Over
Front	Low E Vinyl Windows*	0.350	0.240	East	151.0	0.0
Left	Low E Vinyl Windows*-RP01	0.35	0.27	South	154	1
Rear	Low E Vinyl Windows*	0.350	0.240	West	302.0	0.0
Right	Low E Vinyl Windows*	0.350	0.240	North	98.0	0.0
Glass Door Rear	DRH Houston GI Door*	0.320	0.240	West	24.0	0.0
Glass Door Left	DRH Houston GI Door*	0.320	0.240	South	32.0	0.0
Glass Door Front	DRH Houston GI Door*	0.320	0.240	East	24.0	0.0

Fenestration matches proposed design

Builder Verified
Must Correct
Rater Verified

Rough opening around windows & exterior doors sealed

Builder Verified
Must Correct
Rater Verified

Doors match proposed design

N/A
Must Correct
Rater Verified

Doors

You Are Rating:
123 Apple Lane, Abilene, TX 12345
More

Builder: DR Horton Houston Rating File: 4783 A English







Instant Error Checking (Coming Soon)

ENERGY STAR

123 Apple Lane, Abilene, TX 12345

Complete

Send Report



Windows match proposed design

N/A

Must Correct

Rater Verified

Windows

Name	SHGC	U-Factor	Area (ft²)	Orientation	Overhang	
Front	Low E Vinyl Windows	0.350	0.240	East	151.0	0.0
Left	Low E Vinyl Windows* RP01	0.35	0.27	South	154	1
Rear	Low E Vinyl Windows*	0.350	0.240	North	302.0	0.0
Right	Low E Vinyl Windows*	0.350	0.240	North	98.0	0.0
Glass Door Rear	DRH Houston GI Door*	0.320	0.240	South	24.0	0.0
Glass Door Left	DRH Houston GI Door*	0.320	0.240	South	32.0	0.0
Glass Door	DRH Houston GI Door*	0.320	0.240	South	32.0	0.0

Window SHGC Seems Low

Window SHGC is usually between 0.20 and 1.30.

Are you sure this window is 0.10?

Cancel

Keep

Fenestration match proposed design

Builder Verified

Must Correct

Rater Verified

Rough opening around windows & exterior doors sealed

Builder Verified

Must Correct

Rater Verified

Doors match proposed design


N/A

Must Correct

Rater Verified

Doors

You Are Rating:



123 Apple Lane, Abilene, TX 12345

Builder: DR Horton Houston Rating File: 4783 A English

More

Comments and Photos

ENERGY STAR

123 Apple Lane, Abilene, TX 12345

Complete

Send Report

Insulation levels match proposed design

Builder Verified

Must Correct

Rater Verified

Insulation is Grade I

Builder Verified

Must Correct

Rater Verified

Close

Comments

New

Window:

Window:

Name

Front

Left

Rear

Right

Glass Door

Glass Door

Glass Door

Winston Churchill • May 6th 2018, 7:18 pm

Insulation is great. Nice job.

Fenestration matches proposed design

Builder Verified

Must Correct

Rater Verified

You Are Rating:

123 Apple Lane, Abilene, TX 12345

Builder: DR Horton Houston Rating File: 4783 A English

More



Front Photo

RaterPRO™

10:48 AM
98%

Hi Elliot Seibert
Mock Combined Company 1

HERS Rating
1205 Wishing Well Court, Bel Air, MD 21015
Anns Meadow

Complete
Send Report

Walls

Ceilings & Roofs

Foundation & Floors

Tests

HVAC & Water

Plug Loads, Lighting, PV

Any Inspection Stage, Any Status
Filter

Pre-Drywall

Architectural characteristics match proposed design

Must Correct
Rater Verified

Architectural Characteristics

Housing Type	Apartment Level	Floors Above Grade	Stories Inc. Cond. Bsmt.	Cond. F
Single-family detached	None	3	3	3856

Wall assemblies match proposed

Must
Rater

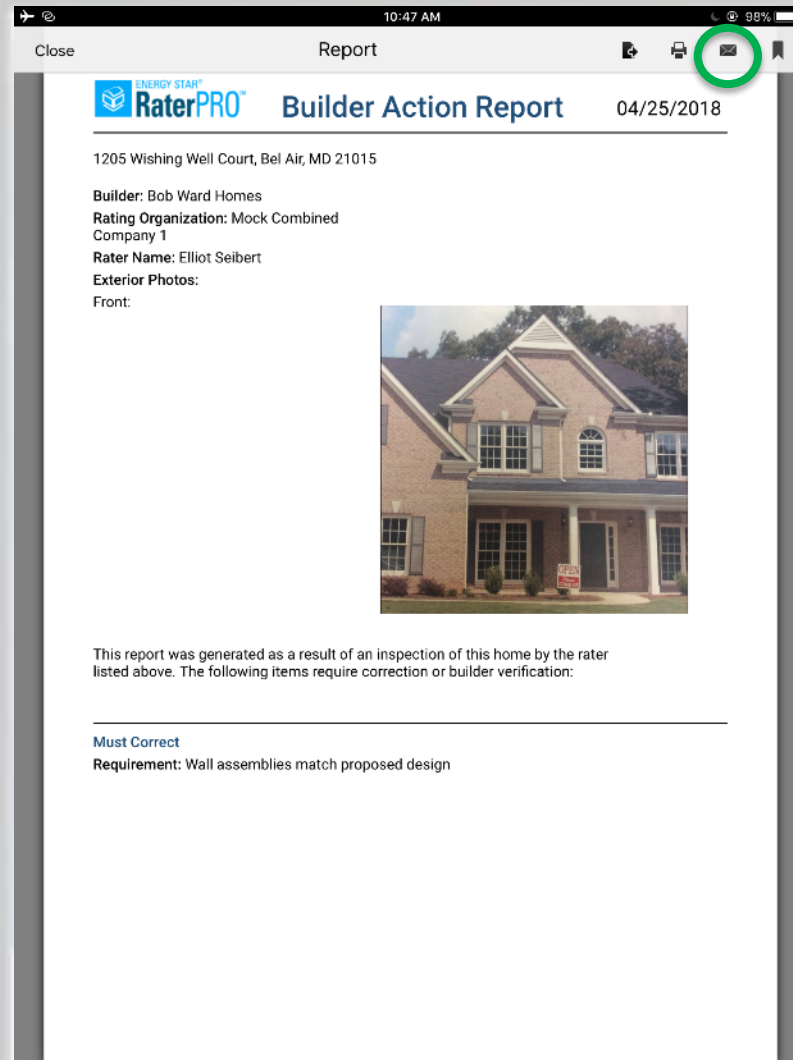
1 Addresses For This Sample Set

★ Primary
1205 Wishing Well Court, ...
Anns Meadow
Builder: Bob Ward Homes
Rating File: The Hampton

Change Photo

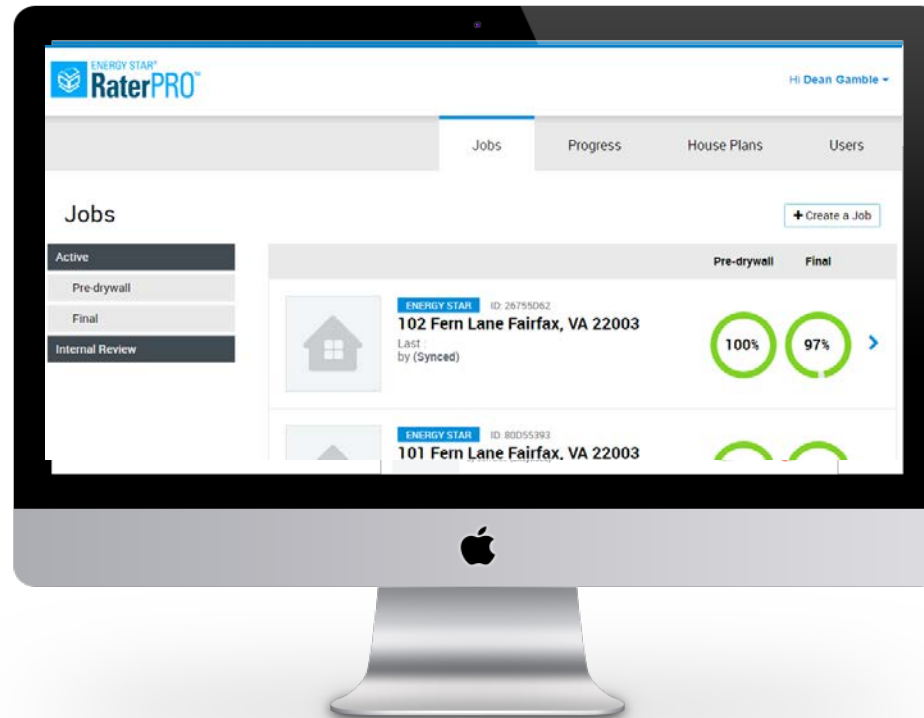
Coming soon:
Geo-tagging

Builder Report

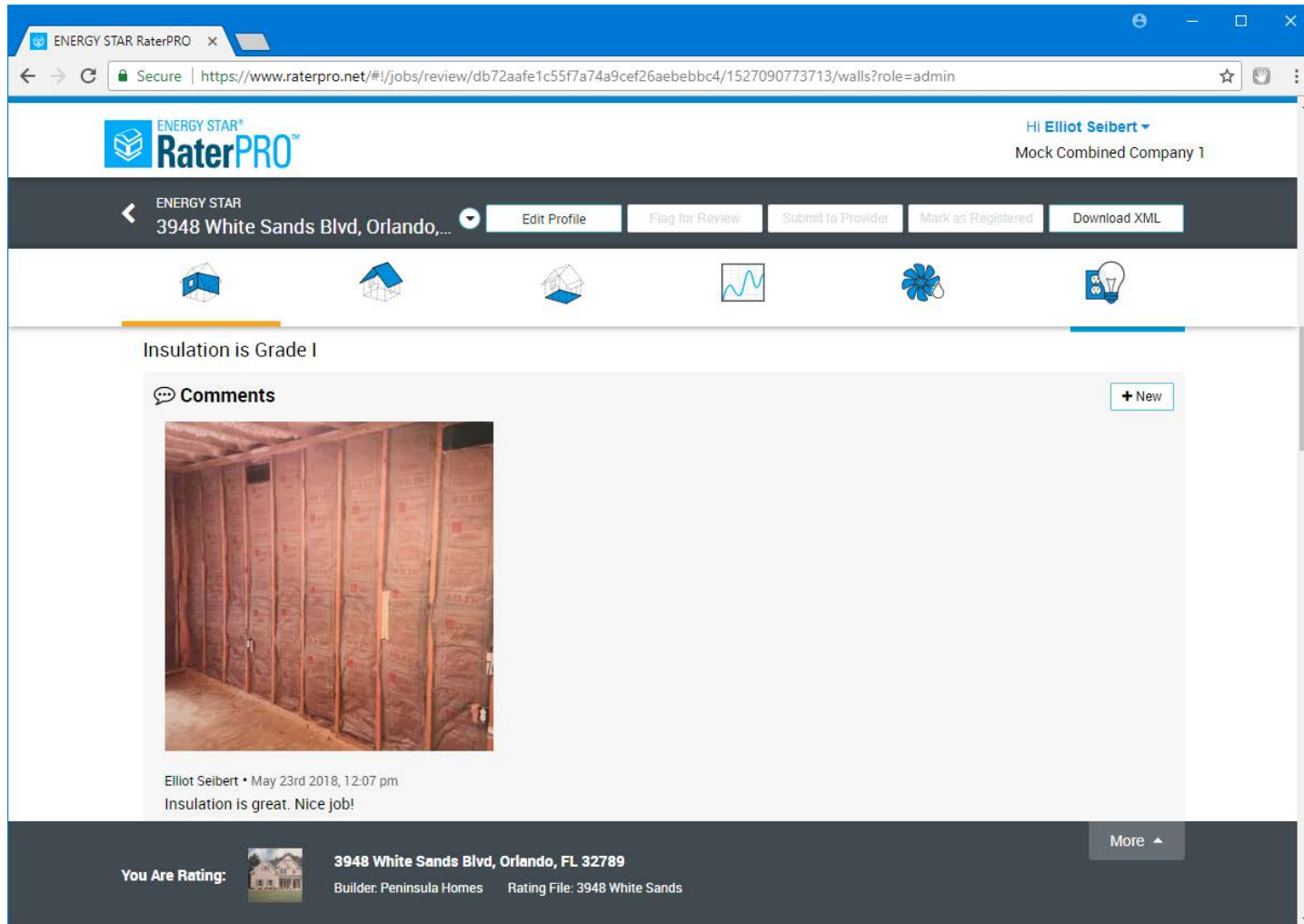


Share via e-mail
(Will use default
e-mail program)

Admin Site



Review Details and Comments



ENERGY STAR RaterPRO

Hi Elliot Seibert
Mock Combined Company 1

ENERGY STAR
3948 White Sands Blvd, Orlando,...


Edit Profile Flag for Review Submit to Provider Mark as Registered Download XML

Insulation is Grade I

Comments

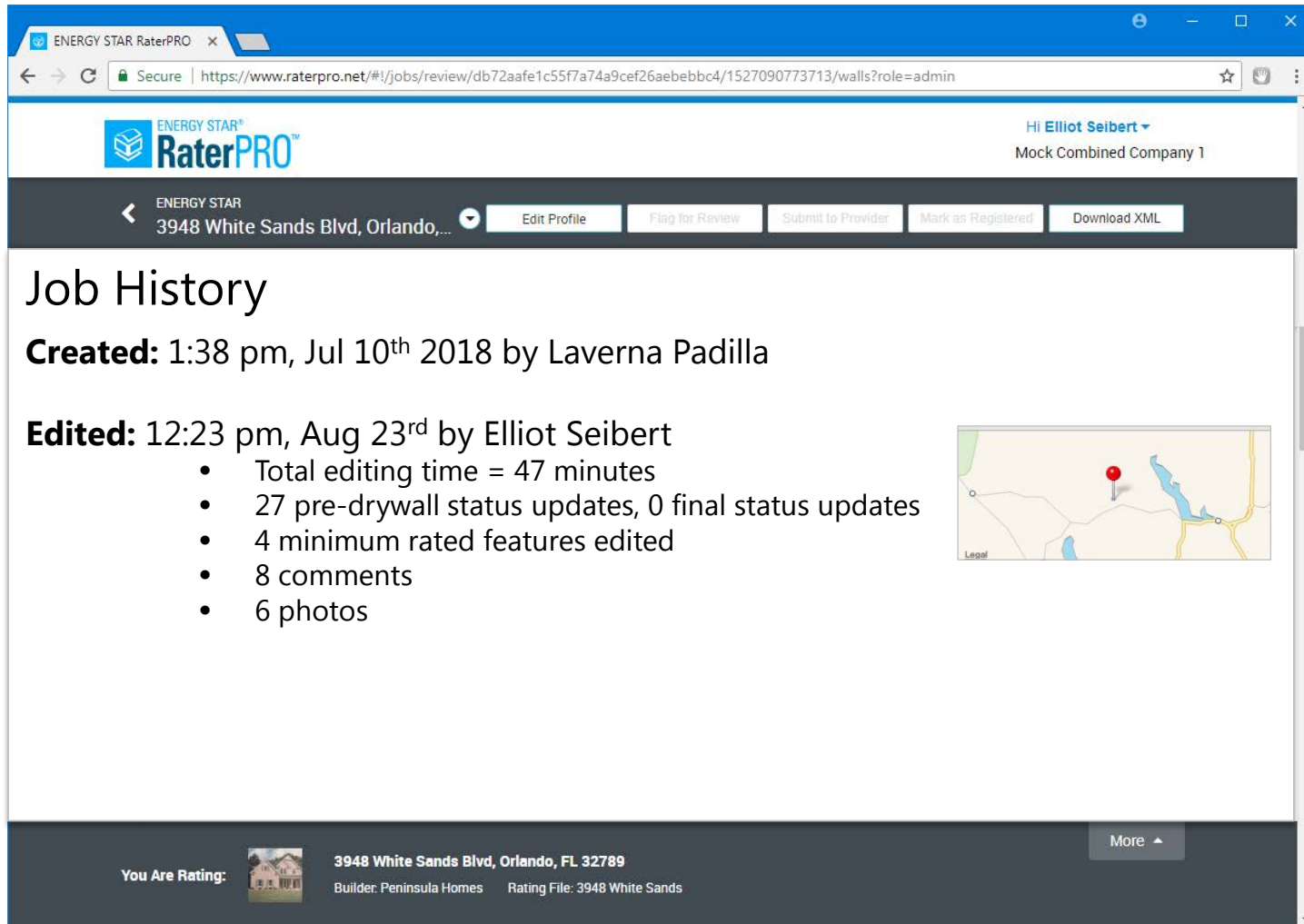
+ New

Elliot Seibert • May 23rd 2018, 12:07 pm
Insulation is great. Nice job!

You Are Rating:  3948 White Sands Blvd, Orlando, FL 32789
Builder: Peninsula Homes Rating File: 3948 White Sands

More

Job History (Coming Soon)



The screenshot shows the ENERGY STAR RaterPRO interface. At the top, the browser address bar displays the URL: <https://www.raterpro.net/#!/jobs/review/db72aafe1c55f7a74a9cef26aebbbc4/1527090773713/walls?role=admin>. The page header includes the ENERGY STAR RaterPRO logo and the user name "Hi Elliot Seibert" with a dropdown arrow, and the company name "Mock Combined Company 1". Below the header, a navigation bar shows the address "3948 White Sands Blvd, Orlando,..." with a dropdown arrow and several action buttons: "Edit Profile", "Flag for Review", "Submit to Provider", "Mark as Registered", and "Download XML". The main content area is titled "Job History" and displays the following information:

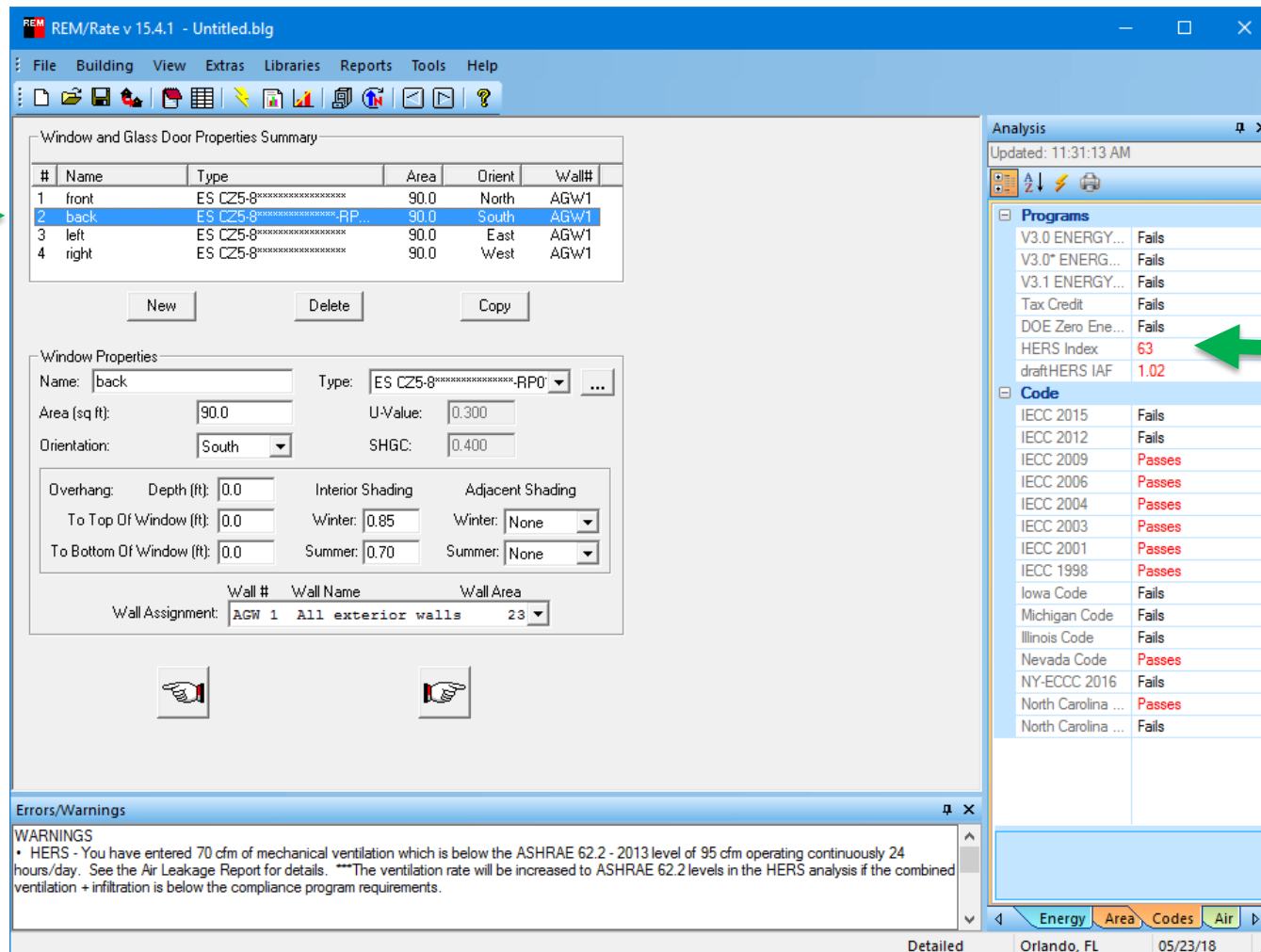
Created: 1:38 pm, Jul 10th 2018 by Laverna Padilla

Edited: 12:23 pm, Aug 23rd by Elliot Seibert

- Total editing time = 47 minutes
- 27 pre-drywall status updates, 0 final status updates
- 4 minimum rated features edited
- 8 comments
- 6 photos

To the right of the list is a small map showing the location of the job. At the bottom of the page, there is a footer section with the text "You Are Rating:" followed by a small image of a house, the address "3948 White Sands Blvd, Orlando, FL 32789", the builder "Builder: Peninsula Homes", and the rating file "Rating File: 3948 White Sands". A "More" button with an upward arrow is also present.

Load XML in REM/Rate



REM/Rate v15.4.1 - Untitled.blg

File Building View Extras Libraries Reports Tools Help

Window and Glass Door Properties Summary

#	Name	Type	Area	Orient	Wall#
1	front	ES C25-8*****	90.0	North	AGW1
2	back	ES C25-8*****RP...	90.0	South	AGW1
3	left	ES C25-8*****	90.0	East	AGW1
4	right	ES C25-8*****	90.0	West	AGW1

New Delete Copy

Window Properties

Name: back Type: ES C25-8*****RP0 ...

Area (sq ft): 90.0 U-Value: 0.300

Orientation: South SHGC: 0.400

Overhang: Depth (ft): 0.0 Interior Shading Adjacent Shading

To Top Of Window (ft): 0.0 Winter: 0.85 Winter: None

To Bottom Of Window (ft): 0.0 Summer: 0.70 Summer: None

Wall # Wall Name Wall Area

Wall Assignment: AGW 1 All exterior walls 23

Errors/Warnings

WARNINGS

- HERS - You have entered 70 cfm of mechanical ventilation which is below the ASHRAE 62.2 - 2013 level of 95 cfm operating continuously 24 hours/day. See the Air Leakage Report for details. ***The ventilation rate will be increased to ASHRAE 62.2 levels in the HERS analysis if the combined ventilation + infiltration is below the compliance program requirements.

Analysis

Updated: 11:31:13 AM

Programs

V3.0 ENERGY...	Fails
V3.0* ENERGY...	Fails
V3.1 ENERGY...	Fails
Tax Credit	Fails
DOE Zero Ene...	Fails
HERS Index	63
draftHERS IAF	1.02

Code

IECC 2015	Fails
IECC 2012	Fails
IECC 2009	Passes
IECC 2006	Passes
IECC 2004	Passes
IECC 2003	Passes
IECC 2001	Passes
IECC 1998	Passes
Iowa Code	Fails
Michigan Code	Fails
Illinois Code	Fails
Nevada Code	Passes
NY-ECCC 2016	Fails
North Carolina ...	Passes
North Carolina ...	Fails

Energy Area Codes Air

Detailed Orlando, FL 05/23/18

ENERGY STAR. The simple choice for energy efficiency.





RaterPRO's Role in the Market

- We strongly believe in digital inspection apps and would love to see them universally adopted
- There are lots of great alternatives available in the market, and more to come
- RaterPRO is intended to offer a *baseline* feature set that we consider the *minimum* for a modern inspection platform
- A free baseline makes it possible for everyone to participate in this digital future
- RaterPRO will eventually be open-source to allow 3rd party developers to leverage RaterPRO for core rating functions while adding their own 'special sauce' on top.



ENERGY STAR Certified Homes

Web & Email:

Main: www.energystar.gov/newhomespartners
Technical: www.energystar.gov/newhomesguidelines
Training: www.energystar.gov/newhomestraining
HVAC: www.energystar.gov/newhomesHVAC
Email: energystarhomes@energystar.gov

Social Media:



@energystarhomes



facebook.com/energystar

Contacts:

Elliot Seibert

EPA

Implementation Manager

ENERGY STAR Certified Homes

Seibert.Elliot@epa.gov