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## NYSERDA Deep Energy Retrofits: House 1 Report

### Exterior Spray Foam Retrofit Strategy

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## Background of the NYSErDA Deep Energy Retrofit Project

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The purpose of this project for the New York State Energy Research and Development Authority (NYSErDA) is to find new or improved strategies for exterior building solutions in regard to insulation that will provide extensive energy-savings benefits for homeowners. Deep Energy Retrofits (DER) is one of the solutions. In the past, DERs have been expensive and hard for the average homeowner to budget. The DER solutions that IBACOS and Green Homes America (GHA) are proposing will be market friendly, affordable, and easily repeatable. The insulation strategies that will be used on nine test homes include the following:

- **Rigid foam insulation** – Four homes will have approximate center-of-wall R-values of R-28, including furring strips for siding, with additional systems approach work to supply the complete integrated DER solution.
- **Spray foam insulation** – Four homes will have approximate center-of-wall R-values of R-30, with additional systems approach work to supply the complete integrated DER solution.
- **HPwES upgrade** – One home will include criteria from the Home Performance with ENERGY STAR<sup>®</sup> (HPwES) program, including dense pack walls and window upgrades for this retrofit strategy.

In addition to the insulation, the strategies will include treatment where needed in the attic, mechanical systems, ventilation and basement band joist, walls, and floors.

This report focuses on the first test home for the NYSErDA DER project. The report walks through a timeline of preconstruction efforts, the construction process, and post-construction activities for House 1, highlighting key areas.

## Overview

### House 1 Existing Conditions

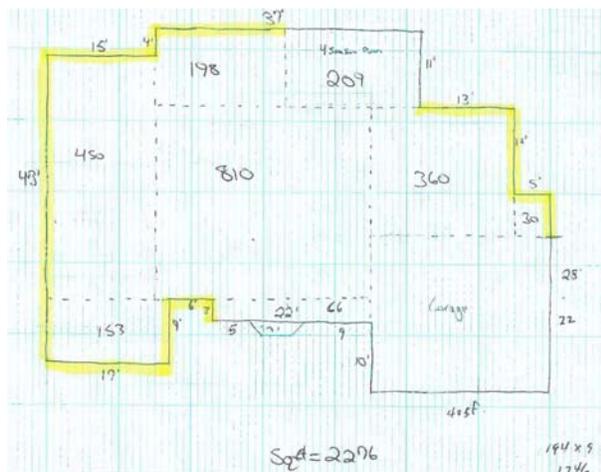
House 1 is the first of nine test homes participating in the DER project for NYSERDA. The home is in a residential neighborhood in Syracuse, New York, located at 819 Nottingham Road. Two occupants currently reside in this single-story, ranch-style home, which was built in the 1970s and has a finished floor area of approximately 2,067 ft<sup>2</sup>. Figure 1 shows the floor plan for House 1.

Prior to construction, GHA assessed the existing conditions of House 1. Appendix A shows the Home Screening Worksheet produced by GHA. The existing home had whole-house air conditioning and natural gas with metal ducts for heating and appeared to have no leaks in the roof. The interior of the home included double-hung windows, R-10 fiberglass insulation in the attic, recessed lighting, and fiberglass wall insulation. Also, a water heater located in the basement had no direct vent and otherwise was vented improperly. Some existing exterior conditions of the home included wide shingles of the shake variety with about 9 inches of exposure, no chimneys, and a small overhang at the front door, as well as some exterior lighting and a gas meter on the exterior. Some of these conditions are shown here in the photos on the right.

This homeowner wanted to be involved in this DER for various reasons including: reducing utility bills, no loan needed, caring about the environment, as well as getting a new look to their home with the conditioned porch.



Figure 1. Preliminary sketch of the House 1 floor plan.



## Planned Approach

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### Strategies for House 1

Once the existing conditions of House 1 were assessed, a workscope was created. This workscope described all of the renovations and updates that were to be done at this residence. House 1 was to receive the spray foam strategy, and the construction included the following:

- Installation of whole-house Mastic Quest<sup>®</sup> vinyl siding in the Woodland Green color, 5-inch width
- Installation of CertainTeed vinyl soffit material for overhangs
- Application of white trim to the fascia, 22 windows, 2 doors, and 1 garage door
- Addition of a dryer vent in the Woodland Green color
- Installation of 3/8-inch sheathing over DER retrofit framing housewrap to cover the sheathing under the siding
- Application of foam board in the garage to increase the R-value to approximately R-15, drywall over that application, and rough finish
- Installation of 2-inch THERMAX<sup>™</sup> Board 4 feet down from the top of the basement wall
- Sealing of all ductwork in the basement with mastic

See Appendix B for the workscope that explains the DER strategies for House 1.

## Preconstruction Process

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### Home Energy Assessment

GHA conducted an energy assessment of House 1 prior to doing any work on the home. GHA was able to conduct blower door testing in House 1, and the results were 2675 CFM50. The energy assessment also revealed to the team that House 1 had central air conditioning installed in 2006, as well as a natural gas HV unit with a 92% efficiency rate.

The existing water heater is not too old. The team was able to install a power venter although it does not give much hot water savings.

See Appendix C for the energy assessment of House 1.

### Homeowner Approval

After discussing the workscope as previously described, the homeowners agreed on the DER construction strategy, timeline, and process. The agreement states that the homeowners will pay \$75,990, which includes a down payment of \$15,000 for the work. In addition to that amount, NYSERDA will contribute \$37,500 from the DER program toward the DER installation.

See Appendix D for the homeowner's construction agreement for House 1.

### Permitting

The permitting process started slightly late for House 1. The code official in the area in which House 1 was located had never seen this type of DER. He wanted to be sure that this construction was safe and therefore asked for a professional stamp on the details, structural calculations, and related materials. In response to this request, IBACOS assembled a package that included the construction drawings for the DER, structural calculations, and a summary letter of how the construction would be executed. IBACOS then collaborated with a licensed structural engineer in New York, who agreed to stamp the package. This stamped package was sent to the code official, and construction was approved to commence.

The lesson learned from this permitting process was that the code official's approval should be obtained well in advance of the anticipated start of construction.

See Appendix E for the letter that was signed and stamped by the code official for permitting .

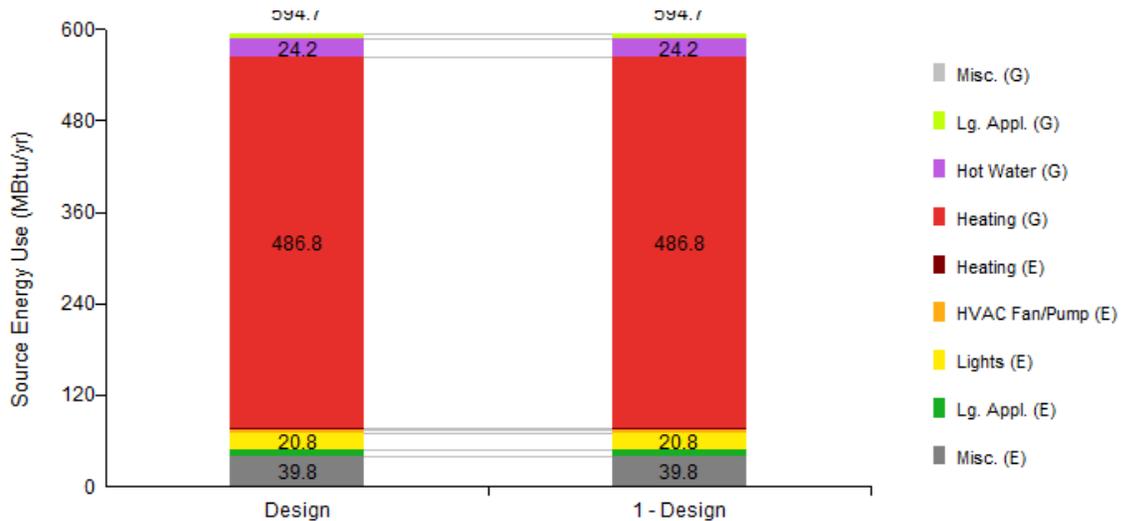
## Modeling

GHA performed Targeted Retrofit Energy Analysis Tool (TREAT) modeling for House 1. TREAT modeling involves entering and analyzing utility bill information, weather data, and building modeling information. The output report shows calculated energy savings for improvements made to the home through the DER.

IBACOS also used Building Energy Optimization (BEopt) software to model the current conditions of House 1. Created by the National Renewable Energy Laboratory (NREL), BEopt is a software program that finds the least-cost solution to designing a zero-energy house. Figure 2 shows the source energy use for the existing House 1 prior to the DER.

See Appendix F for the TREAT modeling outputs for House 1.

Figure 2. BEopt modeling results for House 1.



## Construction Process

### Gathering of Subcontractors

Most of the subcontractors with which GHA works on a regular basis are up to speed on current retrofit solutions. These subcontractors do home performance updates on other homes, so GHA was able to use subcontractors that it typically uses to do this DER work on House 1. The project details were given to the subcontractors, and a meeting was held among IBACOS, GHA, and the subcontractors during the mock-up phase to work through any questions the subcontractors might have had.

### Construction Schedule

GHA created the project schedule, as shown in Figure 3, based on its prior knowledge of energy upgrades to homes. During Week 1 of the project, GHA prepared for the construction by ordering materials, obtaining permits, and notifying manufacturers of the timeline. During Week 2, the subcontractors began to install some mechanical equipment as well as start the energy upgrades to the attic and basement by installing insulation as stated above. During Week 3, the exterior framing of the wall system commenced. In Week 4, the subcontractors installed the windows and doors and added the insulation. This was followed in Week 5 by the addition of new siding on top of the DER system.

Figure 3. Construction schedule for House 1.

		Preliminary Construction Schedule																							
		Deep Energy Retrofit																							
		August								September															
		Week 1		Week 2		Week 3		Week 4		Week 1		Week 2		Week 3		Week 4									
		6	-	10	13	-	17	20	-	24	27	-	31	3	-	7	10	-	14	17	-	21	24	-	28
1	- Order Equipment	█	█	█																					
2	- Obtain Permits	█	█	█																					
3	- Notify Manufacturers	█	█	█																					
4	- HVAC Install				█	█	█																		
5	- Remove Existing Siding																								
6	- Remove Existing Chimney																								
7	- Insulate Existing Walls																								
8	- Install HRV and or Mechanical Exhaust				█	█	█																		
9	- Complete Attic Insulation & Air Sealing				█	█	█																		
10	- Complete Basement Insulation & Air Sealing				█	█	█																		
11	- Install Exterior Wall Framing							█	█	█															
12	- Install Foam Board on Exterior Walls										█	█	█												
13	- Install Windows & Doors										█	█	█												
14	- Spray-Foam Exterior Walls										█	█	█												
15	- Electric Relocation										█	█	█												
16	- New Siding Installation													█	█	█									



## **Construction Log**

Near the end of the project, a log was created to keep track of occurrences on the construction site. The subcontractors will do a trial run with implementing the use of this log to see if it helps to document lessons learned for House 2 and moving forward. This log is intended mainly to keep the subcontractors on schedule and to remind them about what information is needed to keep data on the construction.

See Appendix G for an example of the construction log to be used on site for the remaining houses.

## Construction Process Photos

This photo shows the front of House 1 before any work was done. Notice the bay window and the shake siding.



This view shows the back of the house before any work was done. The screened-in porch will become a fully conditioned space.



This view shows the existing insulation in the attic before any work was done.



The attic received spray foam sealing and insulite boxes for all can light penetrations into the conditioned space. These insulite boxes were used as a standard for all recessed can lights.



This view shows a hole that was patched and sealed with spray foam.



Here, the GHA contractors are installing the blown insulation for the rest of the attic. The existing fiber glass insulation did not need to be removed to install the new insulation and fill the large holes.



The construction then began on the exterior of the home. The homeowners wanted their existing covered porch to be converted into an enclosed, conditioned space. The picture at the right show the beginning stages of construction for this enclosure. The majority of the windows were added to the NE side which was the homeowners choice.



This view shows the framing that is starting to be installed over the existing siding for the spray foam DER.



This view shows the front elevation of the house with most of the frame work installed.



The house then was ready for application of the spray foam. This picture shows the start of that process.



This view shows the connections that were used with this application. Simpson Strong-Tie clips were installed at the top and bottom.



Here is another view of the connections at the top of the framing and around the windows.



This view shows the questionable window installation that was happening on site. When visiting the site, IBACOS made recommendations, and the installation was corrected.



This is an interior view of the windows after the DER. Note the wide sill ledges.



This view shows the basement in the original state prior to the DER.



Here is the THERMAX detail in the basement.



The contractors installed a new ERV for this home, as shown here.



This final picture of the basement shows the spray foam of the rim band joint on top of the THERMAX. The THERMAX was donated and just the cost of labor was needed. The white finish is a new option with THERMAX and was easier to use since the contractor did not have to do any interior finishing.



This view shows the exterior of the home with most of the spray foam insulation installed.



The T-ply sheeting was installed after the insulation. This view shows the T-ply sheeting being attached.



This view shows the tape that was originally used for flashing the windows.



This view shows the correct flashing tape that was installed once corrected.



Full application of the T-ply was done around the entire home.



This photo shows the top of the DER where the system intersects with the roof line.



Here the correct flashing tape is on the windows, the T-ply is fully installed, and the siding is beginning to be applied.



This view shows the bug screen that was installed at the bottom of the new siding application.



This is the front elevation of the home after construction was complete.



Finally, this view of the back side of the house includes the newly built-out conditioned porch space. This porch had .20 U value windows.



## Lessons Learned

Throughout the DER construction of House 1, the subcontractors kept tabs on any unexpected issues that arose. This information was recorded on site by the main contractor so that the issues would be anticipated and fixed during construction of the next home of this type.

During the build-out of the walls, it was discovered that the ledger boards going over existing siding (high and low) created additional layout work and troubleshooting later for both the windows and siding. The distance of the ledger board from the wall could vary, depending on where these ledger boards fell. In the case of House 1, the siding was a wide shingle that left significant variation. This led to creating a new wall surface that did not follow the existing wall and rough opening.

Also, the brackets to the framing did not provide the rigidity expected. With two brackets installed instead of only one, there was flex in the framing and, with the application of spray foam, deflection away from the wall to provide more stability to the framing. There also was a side-to-side bowing from the house, so it was necessary to have a bracket at the midpoint of the wall. This can be a less expensive, non-structural bracket that would just provide the rigidity needed while spraying the insulation. This deflection caused additional “detail” work in installing the windows. Some rough openings were moved out of plumb, which affected the trim work and, in turn, affected timing.

Originally, it had been decided that the windows would be installed after the exterior walls were built; however, it worked better to pull and replace the windows at the same time as the exterior walls were being built. This allowed for sections of wall to be completed but left a gap between the old and new walls that had to be addressed. Instead of a temporary enclosure with tape or OSB to handle foam expansion, it was decided to install the extension jambs along the way as well. This minimized disruptions on the inside as more work was done all at once in a particular area.

Strong tie brackets require many screws; application of these brackets and screws was more time-consuming than initially thought.

Siding had to be stripped in some areas, such as around the bay window in the front of the home. Otherwise, the roofline would have been affected to add the wall thickness needed with the build-out. It did not make sense to affect such a large area of roof with a small area of wall gain. It also would have affected the limited wall area on each side of the window that was not being built out. In the houses that will follow this construction, the construction team will need to discuss with the homeowner the value of removing the bay window and instead installing a large picture window.

Other wall areas near the garage also were stripped of siding to adjust for sections of wall that were not receiving build-out because they were not adjacent to interior walls. It was necessary to remove the shingles from a 5-foot section of wall that was part of this area on the eastern side of the home. That wall was not treated.

The porch was remodeled at the same time as the other work was done, and 6 inches of spray foam were installed in a new-construction fashion. Although the volume of the home changed because of this porch conversion, the R-value of the outside wall rose appropriately.

Spray foam preparatory work included placing plastic over the windows and exposed foundation. However, the subcontractor also built a portable “tent” that propped against the house to minimize overspray onto plantings or other areas adjacent to the house.

## **Material List**

The materials that were used on site included both donated and purchased material. The donated material was from some of the partnering companies for this DER project, including the following: Simpson Strong-Tie, Johns Manville, Dow, Bayer, and Carrier. In addition to donated materials, other materials were purchased to complete the project.

A low pressure foam was given to GHA by Dow to try out in the mockup lab. This low pressure foam seems to still have kinks to work out before use. This could potentially work on a DER project but would take a longer time for the installation.

See Appendix H for a complete list of the material breakdown for this project.



## Cost per Shell Square Foot

One of the main research questions in this DER project is to find a way to make these types of retrofits common and affordable for midstream homeowners. To prove that it is essential to provide costing for the entire project, prior to construction, it was estimated that the cost per shell square foot would be \$17.00, as detailed in Figure 4.

After construction, once the material list was completed and included both donated and bought materials, the true costs were calculated. The costing for the new wall system included the following: removal of minimal siding, new framing, removal of windows, window trim installation, spray foaming, installation of t-ply, bug screen bottom installation and installation of new siding. That cost totaled \$19.01 SSF.

See Appendix I for costing information for this House 1 project.

House 1				
	Units	Effic	Cost	Cost/sf
<b>House 1</b>				
Roof				
Attic	1938	R-50	\$8,721	\$4.50
Walls	1504	R-28	\$25,568	\$17.00
Windows	18	U=.25	\$16,200	\$900.00
Doors	3		\$6,000	\$2,000.00
Basement	190	R-5	\$4,366	\$22.98
C-Space				
Htg				
Clg				
DHW			\$2,200	
Combi				
HRV	1		\$2,500	
Misc Elec			\$1,500	
Permits	1		\$500	
<b>Totals</b>			<b>\$67,555</b>	
<b>Donated</b>				
Attic				
Walls			\$5,102	
Basement			\$1,395	
4				
<b>Tot Donated</b>			<b>\$6,497</b>	
<b>Net Total</b>			<b>\$61,058</b>	
<b>NYSERDA</b>			<b>\$35,000</b>	
<b>Cust \$\$</b>			<b>\$25,058</b>	<b>37.1%</b>
<b>HPwES Loan</b>			<b>\$0</b>	
<b>10% HEMI (Deducted from loan)</b>			<b>\$1,000</b>	

## Testing and Monitoring

### Testing Results

Blower door testing was conducted prior to construction, throughout construction, and at the completion of construction. Table 1 describes these test results. The details used for House 1 include the following:

- Volume : 18,208 ft<sup>2</sup>
- Square feet of conditioned space : 2276 ft<sup>2</sup>
- Perimeter of house : 257 feet
- Wall height : 8 feet
- Shell square footage (ssf) : 6608 ssf

Table 1. DER House 1 Airflow Reductions by Stage.

Improvement Stage	CFM50	CFM50 Reduction from Start	% Reduction from Start	ACH50	CFM50/SSF
Start	2675	0	0%	8.8	0.40
Air Seal Attic	1925	750	28%	6.3	0.29
Wall Build-Out (Including Windows and Foam)	1800	875	33%	5.9	0.27
Spray Foam Band Joist/ERV Installed	1625	1050	39%	5.4	0.25
Air Sealing Between Basement and First Floor	1590	1085	41%	5.2	0.24

Table 2. Above table with Basement volume and surface using available CFM50

Improvement Stage	ACH50	CFM50/SSF
Start	No change	No change
Air Seal Attic	No change	No change
Wall Build-Out (Including Windows and Foam)	No change	No change
Spray Foam Band Joist/ERV Installed	2.68	0.13
Air Sealing Between Basement and First Floor	2.62	0.12

The details used for House 1 plus basement include the following:

- Volume : 36,416 ft<sup>2</sup>
- Square feet of conditioned space : 4,552 ft<sup>2</sup>
- Perimeter of house : 257 feet
- Wall height : 15 feet
- Shell square footage (ssf) : 12959 ssf

This house has a distinctly separate entry to the basement found in the garage, not from within the "conditioned" part of the building. To properly test the total leakage of this home, including the basement, two blower doors should have been run simultaneously. Each blower door would have been representing their part of the building's total leakage.

From past experience with testing similar spaces with one door and then correctly with two, the starting numbers may be no more than a few hundred CFM 50 off, but there is no sure way to know.

Assuming the starting CFM50 number is at least close, we can reason that in including the basement volume and surface area, we would expect results similar to those posted above.

## Future Monitoring

Further monitoring and testing for House 1 will include one full heating season of data collection after completion of the DER and will consist of the following:

- Indoor temperature and relative humidity in the main living space at the main thermostat, in one bedroom, and in conditioned basement area
- Run time of the space heating system
- Outdoor temperature and relative humidity for the Syracuse area in which House 1 is located
- Blower door tests designed to evaluate the impact of the exterior wall insulation strategy with respect to the other DER improvements
- Collection of homeowner utility bills for three months of the heating season prior to DER activity and one year following the DER

See Appendix J the homeowner monitoring agreement for House 1.

## Location of House 1

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House 1 is located at 819 Nottingham Road, Syracuse, NY 13027. See Appendix K for floor plans and elevations.





## Summary

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Construction of House 1 was a success for the DER project and for the homeowners. The team learned valuable lessons during construction that will be able to be applied on the next three homes that receive the same spray foam application. Testing and monitoring will be telling on the success of the energy aspect of the project. After construction was completed the material and cost analysis was beneficial to learning where there may be aspects of the project on which the team could improve. That includes the learning process for the contractors to build the wall system in a smooth and timely manner.

The testing, cost, and materials, among other things, will be improved for the construction of the next DER house due to the lessons learned on this House 1 project.



NYSERDA Deep Energy Retrofits:  
House 1 Report  
Exterior Spray Foam Retrofit Strategy  
November 7, 2012

## Appendix A – Home Screening Worksheet

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# Deep Energy Retrofit: Home Screening Worksheet

## Customer and General House Information

Name: <u>TOM &amp; SANDY LUTZ</u>		Neighborhood of Home: <u>RESIDENTIAL</u>	
Address: <u>81 NOTTINGHAM RD</u>		Does the homeowner have a year's worth of utility information? <u>Y</u> <u>N</u>	
City: <u>SYR</u>	State: <input type="checkbox"/>	Zip Code: <u>13224</u>	# of Occupants: <u>2</u> # of Stories (2.5 Max): <u>1</u> Finished Floor Area (sq ft): <u>2067</u>
Phone 1: <input type="text"/>	Phone 2: <input type="text"/>	Owns: <input checked="" type="checkbox"/> Rents: <input type="checkbox"/>	Structure: Sound <input checked="" type="checkbox"/> Damaged: <input type="checkbox"/>
Heating Fuel: N Gas <input checked="" type="checkbox"/> Oil <input type="checkbox"/> Propane <input type="checkbox"/> Other: <input type="text"/>		Roof: No Leaks <input checked="" type="checkbox"/> Leaks <input type="checkbox"/> Pitch: <input type="text"/>	
AC: Whole House <input checked="" type="checkbox"/> Window Units <input type="checkbox"/> # Units: <input type="text"/> None <input type="checkbox"/>		Ducts: Material: <u>METAL</u>	
Footprint: Rectangle or with one addition or "L" shaped <input checked="" type="checkbox"/> "T" Shaped or More Complex <input type="checkbox"/>		Type of House: <u>RANCH</u>	Apx Age of home: <u>40</u>

## Interior

<b>Windows</b>	Type of Windows: Double Hung # <u>1</u> Casement # <input type="checkbox"/> Other # <input type="checkbox"/> Apx Sq Ft <input type="text"/>
	General Condition: <u>OK</u>
<u>Y</u> <u>N</u> Are there any odd shaped windows or windows > 96 U.I.? If Yes, explain _____	
<b>Attic</b>	<u>Y</u> <u>N</u> Can the attic be accessed easily? If not, can a hatch be installed? _____
	<u>Y</u> <u>N</u> Is the attic insulated? Inches of Insulation <u>R-10</u> Type of Insulation & Condition <u>FIBERGLASS</u>
	Notes: <u>RECESSED LIGHTS</u>
<b>Basement</b>	Dry & Accessible <input type="checkbox"/> Wet or Inaccessible <input type="checkbox"/> Finished <input type="checkbox"/> Unfinished <input type="checkbox"/> Block or Poured Foundation <input type="checkbox"/> Fieldstone or Irregular Foundation <input type="checkbox"/>
	Rim Joist Wood OK <input type="checkbox"/> Rim Joist Rotted <input type="checkbox"/> Type & Condition of Water Heater <u>STORAGE NG</u> <u>Y</u> <u>N</u> Direct Vent?
	Type & Condition of Heating <u>FHA</u> <u>Y</u> <u>N</u> Direct Vent?
	Notes: <u>WAS NOT VENTED PROPERLY, SEALED/CONNECTED INTAKE</u>
<b>General</b>	<u>Y</u> <u>N</u> Is there excessive paint chipping inside? If yes, where _____
	<u>Y</u> <u>N</u> Is the wiring in good condition? If No, explain _____
	<u>Y</u> <u>N</u> Is there existing Wall Insulation? If Yes, please describe <u>FIBERGLASS</u>
	<u>Y</u> <u>N</u> Are there any fireplaces? If Yes, how many/location _____
	<u>Y</u> <u>N</u> Is there any indication of mold issues? If yes, where _____
	<u>Y</u> <u>N</u> Is there evidence of asbestos-like material in the home.? If yes, where _____
General Notes: <input type="text"/>	
Note any homeowner concerns: <input type="text"/>	

# Deep Energy Retrofit: Home Screening Worksheet

Customer Name

Exterior	
<b>Siding</b>	Type & Condition (no asbestos) <i>WIDE SHINGLE/SHAKE 9" EXPOSURE</i>
<b>Chimney</b>	No. & Condition (2 MAX) <i>X</i>
<b>Porch(es)</b>	(And any Overhangs) No. & Condition <i>SM. OVERHANG @ FRONT</i>
<b>Deck(s)</b>	No. & Condition (2 MAX)
<b>Utilities</b>	No. & Condition <i>GAS METER ON EXTERIOR ELEC. SERVICE @ FRONT</i>
<b>Exterior Lighting</b>	Amount & Where <i>FRONT</i>
<b>Landscape</b>	<b>Y</b> <input checked="" type="radio"/> <b>N</b> Is there any landscaping that interferes with work that cannot be removed? If yes, explain below.
	<b>Y</b> <input checked="" type="radio"/> <b>N</b> Are there any noticeable setback issues? If yes, explain below.
<b>Notes:</b>	<input type="text"/>

**At a minimum, the following photographs should be taken:**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> House Elevations- Front/Back/Sides             | <input type="checkbox"/> Problems such as Damage                     |
| <input checked="" type="checkbox"/> Soffits  | <input type="checkbox"/> Exterior Lighting                           |
| <input checked="" type="checkbox"/> Gables   | <input type="checkbox"/> Electrical                                  |
| <input checked="" type="checkbox"/> Roof Trim Details                              | <input type="checkbox"/> Plumbing                                    |
| <input checked="" type="checkbox"/> Any Decks and/or Porches - Connection to House | <input type="checkbox"/> Utility Entrances (elec, gas, oil, propane) |
| <input checked="" type="checkbox"/> Chimney  | <input type="checkbox"/> Roof/Wall Intersections                     |
| <input checked="" type="checkbox"/> Basement Interior Walls, including clutter     | <input type="checkbox"/> General Picture of each Room                |
| <input checked="" type="checkbox"/> Heating System and Ductwork                    |  |
| <input checked="" type="checkbox"/> Damaged and Typical Window(s)                  |  |



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Exterior Spray Foam Retrofit Strategy  
November 7, 2012

## Appendix B – Workscope

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# Siding Work Scope

801 Hiawatha Blvd. E., Syracuse, NY 13208 315-474-6549

New York State's Most Awarded Contractor

Homeowner: <u>TOM &amp; SANDY LUTZ</u>	Date: <u>6/1/12</u>
Street: <u>819 NOTTINGHAM RD.</u>	City: <u>SYRACUSE</u> Zip: <u>13224</u>
Home Phone: _____	Cell Phone: _____ Work Phone: _____
Advisor: <u>JOSEPH REVERE / JOHN SCIPIONE</u>	

Building Type: RANCH CAPE SPLIT BUNGALOW COLONIAL CONTEMPORARY TWO-FAMILY OTHER

Proposal to furnish and install the following:

Complete Siding Preparations	<input checked="" type="checkbox"/> Home exterior, shrubs, landscaping, trees to be protected from damage.
	<input checked="" type="checkbox"/> Customer to take down pictures, mirrors, and/or delicate items from interior of wall.
	<input checked="" type="checkbox"/> Site to be left in basic good order each day, debris removed at project completion.
	<input type="checkbox"/> Remove existing siding ( <input type="checkbox"/> alum <input type="checkbox"/> cedar shake, <input type="checkbox"/> other _____ ) and haul away. <u>(N/A)</u>
	<input checked="" type="checkbox"/> Existing eave soffit to be either opened completely or cut open as wide as possible to allow maximum ventilation.
	<input type="checkbox"/> Remove, frame in, and side over following areas: _____
	<input type="checkbox"/> Apply 3/8" fanfold foam underlayment over area to be sided: Style: ( <input type="checkbox"/> Standard <input type="checkbox"/> High-R solid core ) Brand _____
	<input checked="" type="checkbox"/> If sheathing is needed, it shall be added at \$45 per sheet.
Siding	<input checked="" type="checkbox"/> Vinyl Siding to be applied over specified areas: ( <input checked="" type="checkbox"/> House <input checked="" type="checkbox"/> Attached Garage <input type="checkbox"/> Detached Garage <input type="checkbox"/> Other _____ ) <input type="checkbox"/> Exclusions _____ Brand <u>MASTIC</u> Line <u>QUEST</u> Color <u>WOODLAND GREEN</u> Size <u>5"</u> Profile: <u>CLAP.</u>
	<input type="checkbox"/> SPECIALTY Siding to be applied over specified areas: Brand _____ Line _____ Color _____ Size _____ Profile: _____
Soffit & Trim	<input checked="" type="checkbox"/> Apply vinyl soffit material to: <u>CERTAINTEED - (INVISAVENT)</u> ( <input checked="" type="checkbox"/> Overhangs <input type="checkbox"/> Porch Ceiling(s) <input type="checkbox"/> Inner skirting <input type="checkbox"/> Other <u>OVERHANGS</u> ) <input type="checkbox"/> Exclusions _____ Brand: ( <input type="checkbox"/> Universal <input type="checkbox"/> Other _____ ) Color _____ Rakes, ceilings & skirting to be solid. Eaves to be: ( <input type="checkbox"/> Solid <input type="checkbox"/> Center-vent <input type="checkbox"/> Full-vent )
	<input checked="" type="checkbox"/> Trim to be applied to the following areas: <u>LINERS ON WINDOWS / BRICKMOLD ON DOORS.</u> ( <input checked="" type="checkbox"/> Fascia <input type="checkbox"/> Crown <input type="checkbox"/> Freeze <input type="checkbox"/> Windows <input type="checkbox"/> Doors <input type="checkbox"/> Garage Doors <input type="checkbox"/> Posts <input type="checkbox"/> Beams ) Brand _____ Color <u>WHITE</u> Profile: ( <input type="checkbox"/> Brick mold <input type="checkbox"/> Other _____ ) ( <input type="checkbox"/> Smooth <input type="checkbox"/> PVC )
Accessories	<input type="checkbox"/> Apply Shutters: Brand: <u>Mid-America</u> Quantity: # _____ pairs Style Code: _____ Color# _____ Locations: (As listed on measure sheet)
	<input type="checkbox"/> Gable end vents: ( <input type="checkbox"/> Trim around existing <input type="checkbox"/> Replace with new <input type="checkbox"/> Eliminate and side over ) If new, then: Quantity: # _____ Shape: _____ Color: _____ Size: (H) _____ (W) _____ <u>(N/A)</u>
	<input checked="" type="checkbox"/> Utility Blocks: Color: <u>WOODLAND GREEN</u> ( <input type="checkbox"/> #5 Electrical <input type="checkbox"/> #2 Split spigot <input type="checkbox"/> # _____ Other _____ )
	<input checked="" type="checkbox"/> Dryer vent: ( <input type="checkbox"/> Trim around existing <input type="checkbox"/> Replace with new ) If new, then: Quantity: # <u>1</u> Color: <u>WOODLAND GREEN</u> Color: _____ Size: ( <input type="checkbox"/> 4" <input type="checkbox"/> 6" )
<input checked="" type="checkbox"/> Gutters: If new, then: Color: _____ Location(s): _____ ( <input type="checkbox"/> Remove and dispose of <input checked="" type="checkbox"/> Remove and reset if salvageable <input type="checkbox"/> Leave in place and trim up to <input type="checkbox"/> Replace with new )	

Comments: 3/8" SHEATHING TO BE INSTALLED OVER DER RETROFIT FRAMING. HOUSE WRAP TO COVER SHEATHING UNDER SIDING.

1057 Sandra H. Lutz  
Monica G. Lutz M.S.

Client \_\_\_\_\_ Acct# \_\_\_\_\_

ATTIC INSULATION

House Type:  Ranch  Cape  Raised Ranch  Split Level  Bungalow  Colonial  2 - Family  Other: \_\_\_\_\_
Siding type:  Vinyl  Alum  4" Cedar Shakes  \_\_\_\_\_ Boards  \_\_\_\_\_; Brkr. Avail?  Yes  No; To Brkr. \_\_\_\_\_ ft. Gen. Needed?  Yes  No

Insulate the following attic areas:

Table with 7 columns: Attic Area Description, Area Ft², Existing Effective R-Value, Insulation Type (CELLULOSE/FOAMS), Inches Added, Final Approx. R-Value. Rows include Main Hall, Sun Room, and Stairway Entries.

WALL INSULATION

Insulate the following wall areas:

Table with 7 columns: Wall Area Description, Area Ft², Existing Effective R-Value, Insulation Type (CELLULOSE/FOAMS), Inches Added, Final Approx. R-Value. Rows include Exterior Walls and Garage Wall.

BASEMENT, CRAWL SPACE AND GARAGE CEILING INSULATION

- 51. Rim Joists - Insulate with 2 inches of closed cell foam around the basement perimeter for approx. 190 lf.
52. Basement / Crawl - Spray \_\_\_\_\_ inch(es) of closed cell foam to interior foundation walls of crawlspace for approx. \_\_\_\_\_ sf.
53. Vapor Barrier - Install vapor barrier on crawl space ground with (6/12/16/ \_\_\_\_\_ mil) barrier for approx. \_\_\_\_\_ sf.
54. Floor Joists - \_\_\_\_\_ Dense pack underside of floor with \_\_\_\_\_ in. of cellulose \_\_\_\_\_ Spray \_\_\_\_\_ in. of closed cell foam approx. \_\_\_\_\_ sf.
55. Garage Ceiling - Dense pack ceiling with cellulose for approx. \_\_\_\_\_ square feet, resulting in approximately R-\_\_\_\_\_.
56. IN STALL 2" THERMAX BOARDS 4' DOWN FROM TOP OF BASEMENT WALL.

Client Acceptance: [Signatures] GreenHomes America: [Signature]

Client \_\_\_\_\_ Acct# \_\_\_\_\_

**AIR SEALING - Attics**

- 1.  **Attic Penetrations** - Air Seal around  Electrical  Vent Pipes  Fans  Duct Penetrations  Access Hatch
- 2.  **Attic Chimney / Flues** - Air Seal around  Chimney  Flue Penetrations with proper fire resistant materials.
- 3.  **Top of Wall Plates** - Air Seal Top of Wall Plates  Interior Partition  Exterior Perimeter
- 4.  **Drop Soffits** - Air Seal Drop Soffits  Kitchen  Bathroom  \_\_\_\_\_ . Size: \_\_\_\_\_ x \_\_\_\_\_ .
- 5.  **Open Stairwells** - Air Seal Open Stairwells with foam board or appropriate material in attic. Size: \_\_\_\_\_ x \_\_\_\_\_ .
- 6.  **Recessed Lights** -  Box Over and Air Seal # 6 lights.  Air seal with custom interior inserts # \_\_\_\_\_ lights.
- 7.  **Floor Joists** - Air Seal Open Floor Joists under  kneewalls  verticals, with foam board. \_\_\_\_\_ lf.

**AIR SEALING - Basements**

- 8.  **Basement Penetrations** - Air Seal accessible  Electrical  Pipes  Ductwork; *through*  flooring  rim joists.
- 9.  **Chimneys / Flues** - Air Seal around  Chimney  Flue penetrations into the conditioned space.
- 10.  **Rim Joist** - Air Seal Rim Joist bottom plate to top of foundation wall in  basement  crawlspace
- 11.  **Basement Windows**  Silicone around perimeter # \_\_\_\_\_  Foam Board over opening(s) # \_\_\_\_\_, location \_\_\_\_\_.

**AIR SEALING - Other**

- 12.  **Penetrations to Garage** - Air Seal  Duct / Pipe Penetrations  Misc. Bypasses; connecting conditioned space to garage.
- 13.  **Exterior Doors** -  Front \_\_\_\_\_ (Weatherstrip / Sweep)  Side \_\_\_\_\_ (Weatherstrip / Sweep)  Rear \_\_\_\_\_ (Weatherstrip / Sweep)
- 14.  **Door Trim** - Caulk:  Interior Trim: # \_\_\_\_\_ Color: \_\_\_\_\_ Loc. \_\_\_\_\_  Exterior Trim # \_\_\_\_\_ Color: \_\_\_\_\_ Loc. \_\_\_\_\_
- 15.  **Window Trim** - Caulk:  Interior Trim: # \_\_\_\_\_ Color: \_\_\_\_\_ Loc. \_\_\_\_\_  Exterior Trim # \_\_\_\_\_ Color: \_\_\_\_\_ Loc. \_\_\_\_\_
- 16.  **Baseboard Trim - Caulk:** Room Locations: \_\_\_\_\_
- 17.  **Whole House Fan:**  Remove / Drywall & One Skim Coat  Dam around fan in attic & Install removable cover to air seal.
- 18.
- 19.  SEAL ALL EXPOSED DUCT WORK IN BASEMENT WITH MASTIC.

**ROOF VENTILATION**

- 20.  **Ridge Vents** - Add ridge vent for approximately \_\_\_\_\_ lf. Shingle Cap Color \_\_\_\_\_  Close off ridge vent
- 21.  **Roof Vents** - Add \_\_\_\_\_ (12" x 12") box vents. Location(s) \_\_\_\_\_ color \_\_\_\_\_ surface \_\_\_\_\_
- 22.  **Gable Vents** - Add \_\_\_\_\_ ( " x " ) louvered gable vents. Location(s) \_\_\_\_\_ color \_\_\_\_\_ surface \_\_\_\_\_
- 23.  **Gable Vents** - Block existing gable end vents promote greater lower soffit air intake flow.
- 24.  **Soffit Vents** - Add \_\_\_\_\_ soffit vents. Location(s) \_\_\_\_\_ color \_\_\_\_\_ size \_\_\_\_\_.
- 25.  **Soffit Vents** - Remove perforated soffit materials, create openings and reinstall soffit materials. \_\_\_\_\_ lf.
- 26.  **Baffles** - Add new baffles to provide clear ventilation from soffits to attic space above insulation as needed.
- 27.  **Exhaust Fans** - Redirect Bath fan(s) # \_\_\_\_\_ to  roof  gable end. Kitchen fan to  roof  gable end. (Insulated Ducts)
- 28.  **Dryer Vents** - Install  metal hard pipe  flex duct and vent to exterior **OR**  Replace vent on dryer with hard pipe only.
- 29.  Open Fully Plywood Soffits, to except Invisavent Vinyl Soffit material

Client Acceptance:

Sandra H. Galt  
Date: 6/29/2012

Client Acceptance:

Monica G. Galt M.D.  
Date: 6/29/2012

GreenHomes America:

[Signature]  
Date: 6/29/12

Client LUTZ

Acct#

REPLACEMENT WINDOWS

	Measurements W X H	Fl	Room	Old Style	New Style	Color E/I	Glass Type	Grids T/B	Alum Clad	Scrns H/F	New Mldgs	MFR / Model
21	41 x 52	1	Dinning	TSL	DA	W W	3P	6 -		1/2		OKNA 850
20	31 x 64	1	"	CS	DA	W W	3P	4 -		1/2		ERJU ROSTAR
38	60 x 64	1	"	PW	DA	W W	3P					
20	31 x 64	1	"	CS	DA	W W	3P	4 -		1/2		
21	41 x 52	1	F Bath	TLS	DA	W W	3P	6 -		1/2		
21	41 x 52	1	"	TLS	DA	W W	3P	6 -		1/2		
5	20 x 28	1	F Bath	LS	LS	W W	3P			Full		
21	41 x 52	1	B Bath	TLS	DA	W W	3P	6 -		1/2		
21	41 x 52	1	"	TLS	DA	W W	3P	6 -		1/2		
5	20 x 28	1	B Bath	LS	LS	W W				Full		
21	41 x 52	1	OFF	TLS	DA	W W		6 -		1/2		
21	41 x 28	1	"	TLS	SL	W W				Full		
5	20 x 28	1	Laundry	LS	LS	W W				Full		
21	41 x 52	1	Living	TLS	DA			6 -		1/2		
17	28 x 64	1	Living	LS	DA			4 -		1/2		
45	22 x 64	1	"	PW	PW							
17	28 x 64	1	"	LS	DA			4 -		Full		
34	58 x 60	1	Sun R	SL	SL	W W				Full	Yes	OKNA 800
34	58 x 60	1										
34	58 x 60	1										
34	58 x 60	1										
34	58 x 60	1										
	X											
	X											
	X											

**R C I** LINEALS ON WINDOWS

120.   Vinyl-coated coil exterior trim:  
Flat \_\_\_\_\_ Textured \_\_\_\_\_ Color WHITE

121.    Dense pack casing w/ cellulose. Qty \_\_\_\_\_

**R C I** DER EXTENSION JAMBS

122.   Interior trim replaced.  
Vinyl stop pcs: \_\_\_\_\_ Wood stop pcs: \_\_\_\_\_

Yes  No  Alarm System Present?  
Yes  No  Fire egress in all bedrooms?

**Special Instructions / Custom Carpentry:**  
ORNA Lifetime Non-Prorated Transferable Warranty,  
GHA - 5yr. Labor Warranty.

<input type="checkbox"/> Bay	Extension in Inches from wall	Profile	Top Finish	Top Color	Top profile	Operating
<input type="checkbox"/> Bow		<input type="checkbox"/> 30° <input type="checkbox"/> 45°	<input type="checkbox"/> Roof <input type="checkbox"/> Soffit		<input type="checkbox"/> 3-Tab <input type="checkbox"/> Arch Brand <input type="checkbox"/> Soffit profile	/ / / / / /

**Style:** Double Hung=DH; Twin/Triple Double Hung=2DH/3DH; 2-Lite Slider=SL; 3-Lite Slider=EVS; Operating Casement=CS; Fixed Casement=FX;  
Dead Lite=WDL; Awning=AW; Garden=GAR; Hopper=H; Picture w/ 2DH flankers=DHP; BAY; BOW

**U-Values by Glazing Type:** Dbl-Glazed Low-E (Climatech): .32; Dble-Glazed, Dble-Coated Low-E (Climatech 2): U=.30; Triple-Glazed Low-E: U=.26

**GHA Colors:** White=WH; Beige=BG; Cherry=CH; Light Oak=LO; Dark Oak=DO; American Brown=AB

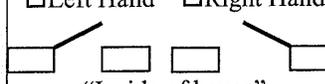
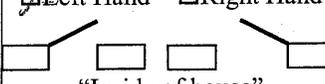
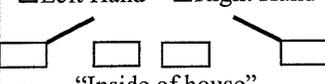
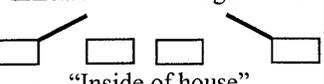
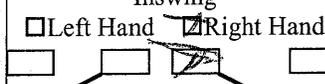
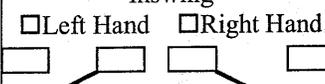
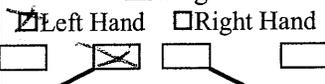
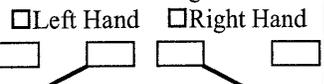
**GL & ACW Colors:** White=WH; Colonial White=CW; Ivory=IV; Cherry=CH; Golden Oak=GO; Natural Oak=NO; Camel/Sandstone=C/S; Earhtone/Timbertone=E/T

**Grids:** Vertical=V; Horizontal=H; Williamsburg=W; Georgian=G; Standard=S; Euro=E; Regal Colonial=RC; Regal Florentine=RF

**Aluminum Clad:** Stops (Partial or L-Bend)=S; Full (C-Bend)=F; Brick Mold=BM; 5 Inches Wide=W; Crown=C **Molding:** Shingle Mold=SGM; Shoe Mold=Shoe

**Manufacture:** Alside=AL; SunRise=SR; Great Lakes=GL; **Glass Type:** low E Argon Gas=LEA; Triple Pane Argon / Krypton=3PA/ 3PK

Client \_\_\_\_\_ Acct# \_\_\_\_\_

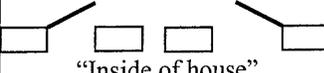
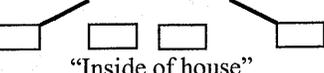
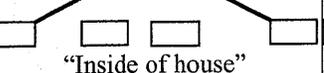
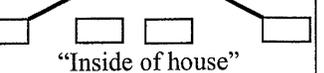
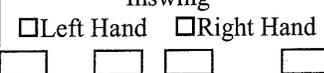
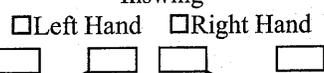
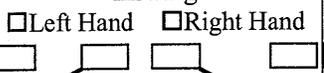
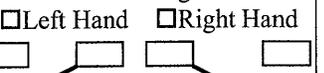
	R C I 123 A. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	R C I 123 B. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	R C I 123 C. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	R C I 123 D. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
LOCATION	Front Door	Front Door	Porch Ext Door	
MFG	Provia	Provia (Storm)	Provia 440C	
MODEL #	400 TII	<del>377</del> 399	3/4 Lite	
TYPE	<input checked="" type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD	<input type="checkbox"/> NC <input type="checkbox"/> RD <input checked="" type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD	<input type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD	<input type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD
SIZE	W 36 " H 80 "	W 36 " H 80 "	W 36 " H 80 "	W _____ " H _____ "
COLOR	Ext. <u>Natural oak</u> Int. <u>Natural oak</u>	Ext. <u>White</u> Int. <u>White</u>	Ext. <u>White</u> Int. <u>White</u>	Ext. _____ Int. _____
Choose One Swing	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input checked="" type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"
	Inswing <input type="checkbox"/> Left Hand <input checked="" type="checkbox"/> Right Hand  "Inside of house"	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Inswing <input checked="" type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"
SLIDE (X/O)	_____ "Outside of house"	_____ "Outside of house"	_____ "Outside of house"	_____ "Outside of house"
LOCK STYLE	<del>ACCENT</del> <del>LEVEL</del>	Std	ACCENT <del>LEVEL</del>	
LOCK FINISH	Oil Rubbed	White	Oil Rubbed	
JAMB DEPTH				
TRIM: EXT/INT	Ext. <u>White</u> Int. <u>Natural oak</u>	Ext. _____ Int. _____	Ext. _____ Int. _____	Ext. _____ Int. _____
Accessories				
Glass	Twilight			

Special Instructions:

RD = Replacement Door    SD = Storm Door    NC = New Construction    SPD = Sliding Patio Door    HPD = Hinged Patio Door    BM = Brick Mold    Fixed = O    Operator = X

Code: R = Recommended    C = Contracted    I = Installed

Client \_\_\_\_\_ Acct# \_\_\_\_\_

	R C I 123 A. □ □ □	R C I 123 B. □ □ □	R C I 123 C. □ □ □	R C I 123 D. □ □ □
LOCATION	Dinning to Porch	Kitchen to Porch		
MFG	OKna	OKNA		
MODEL #	8800 PD	8800 PD		
TYPE	<input checked="" type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input checked="" type="checkbox"/> SPD <input type="checkbox"/> HPD	<input checked="" type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input checked="" type="checkbox"/> SPD <input type="checkbox"/> HPD	<input type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD	<input type="checkbox"/> NC <input type="checkbox"/> RD <input type="checkbox"/> SD <input type="checkbox"/> SPD <input type="checkbox"/> HPD
SIZE	W 72" H 80"	W _____" H _____"	W _____" H _____"	W _____" H _____"
COLOR	Ext. Wh Int. Wh	Ext. Wh Int. Wh	Ext. _____ Int. _____	Ext. _____ Int. _____
Choose One Swing	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Outswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"
	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"	Inswing <input type="checkbox"/> Left Hand <input type="checkbox"/> Right Hand  "Inside of house"
SLIDE (X/O)	X - O "Outside of house"	O - X - I "Outside of house"	- - - "Outside of house"	- - - "Outside of house"
LOCK STYLE	Multi Point	Multi Point		
LOCK FINISH	White	White		
JAMB DEPTH	Std	Std		
TRIM: EXT/INT	Ext. _____ Int. _____	Ext. _____ Int. _____	Ext. _____ Int. _____	Ext. _____ Int. _____
Accessories				
Glass				

Special Instructions:

RD = Replacement Door    SD = Storm Door    NC = New Construction    SPD = Sliding Patio Door    HPD = Hinged Patio Door    BM = Brick Mold    Fixed = O    Operator = X

Code: R = Recommended    C = Contracted    I = Installed

Client \_\_\_\_\_

Acct# \_\_\_\_\_

### DOMESTIC HOT WATER SYSTEMS

- 38.  New DHW - \_\_\_\_ (qty.) new \_\_\_\_ gal. \_\_\_\_\_ gas /oil/electric water heater(s) w/ Energy Factor of \_\_\_\_.
- 39.  New DHW - PV - \_\_\_\_ (qty.) new \_\_\_\_ gal. \_\_\_\_\_ gas power vent water heater(s) w/ Energy Factor of \_\_\_\_.
- 40.  Tankless DHW - \_\_\_\_ (qty.) new \_\_\_\_\_ tankless gas water heater(s) providing up to \_\_\_\_ gal./min.
- 41.  Indirect DHW - \_\_\_\_ (qty.) new \_\_\_\_ gal. indirect-fired water heater tank(s) zoned off boiler(s) \_\_\_\_\_
- 42.  Power Vent Ex. - 1 (qty.) install new Power Vent to existing water heater.
- 43.  Warranty - \_\_\_\_\_ Yr Parts Warranty \_\_\_\_\_ Yr Labor Warranty

### HEALTH AND SAFETY/INDOOR AIR QUALITY

- 44.  CO Detector - Carbon monoxide (CO) detector
- 45.  Skuttle - Skuttle fresh air mixing system
- 46.  Air Cleaner - Media air cleaner boot
- 47.  Anti-Microbial - Anti-Microbial Treatment
- 48.  Humidifier - Auto. Flow-Thru Humidifier
- 49.  Other - \_\_\_\_\_
- 50.  Air Purifier - Whole House Air Purifier: \_\_\_\_\_ Deluxe \_\_\_\_\_ Premium \_\_\_\_\_ Optimum
- 51.  House UV - Whole House UV Cleanser : \_\_\_\_\_ Deluxe \_\_\_\_\_ Premium \_\_\_\_\_ Optimum
- 52.  HRV/ERV - HRV / ERV Air-to-Air Heat Exchanger. Model: \_\_\_\_\_
- 53.  New Fan 1 - Install vent fan to outside. Location 1: \_\_\_\_\_ With light? \_\_\_\_ New Electric? \_\_\_\_ Humidistat? \_\_\_\_
- 54.  New Fan 2 - Install vent fan to outside. Location 2: \_\_\_\_\_ With light? \_\_\_\_ New Electric? \_\_\_\_ Humidistat? \_\_\_\_
- 55.  Gas Leaks - Gas leaks to be fixed by: \_\_\_\_ customer \_\_\_\_ GreenHomes before balance of work. Qty: \_\_\_\_\_  
- Locations: \_\_\_\_\_
- 56.  Other - \_\_\_\_\_

### MISC HVAC

- 57.  Gas Piping - Install New Gas Piping - Ft: \_\_\_\_\_
- 58.  Cond. Pump - Install New Condensate Pump
- 59.  Electric Panel - Install New Electric Panel Upgrade
- 60.  Cond. Drain - Install New Condensate Drain
- 61.  Flue Liner - Install New Flue Piping - Ft: \_\_\_\_\_
- 62.  Ref. Line Cover - Exterior Refrigerant Line Encl.
- 63.  Other - \_\_\_\_\_
- 64.  Other - \_\_\_\_\_

- 65.  \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 66.  \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Client Acceptance:

*Sandra N. Lutz*  
Date: 6/29/2012

Client Acceptance:

*James C. W. M.D.*  
Date: 6/29/2012

GreenHomes America:

*[Signature]*  
Date: 6/29/12



**GreenHomes™**  
A M E R I C A

801 Hiawatha Blvd. E., Syracuse, NY 13208  
PH :( 315) 474-6549 Fax :( 315) 424-6887

ACKNOWLEDGEMENT RECEIPT OF RIGHT TO CANCEL

YOU, THE BUYER/CLIENT, MAY CANCEL THIS TRANSACTION AT ANY TIME PRIOR TO MIDNIGHT OF THE THIRD BUSINESS DAY AFTER YOU SIGN THE AGREEMENT. SEE THE ATTACHED NOTICE OF RIGHT TO CANCEL FORM FOR AN EXPLANATION OF THIS RIGHT.

I hereby acknowledge receipt of two copies of the below Notice of Right to Cancel

Client Signature X Sandra H. Lutz Date: 06/29/2012

Client Signature X Thomas G. Lutz M.D. Date: 06/29/2012

NOTICE OF CANCELLATION

YOU HAVE AN UNCONDITIONAL RIGHT TO CANCEL THIS TRANSACTION, WITHOUT ANY PENALTY OR OBLIGATION, WITHIN THREE (3) BUSINESS DAYS FROM THE DATE YOU SIGN THE AGREEMENT.

IF YOU CANCEL WITHIN THE THREE (3) DAY PERIOD, ANY PROPERTY TRADED IN, ANY PAYMENTS MADE BY YOU UNDER THE AGREEMENT, CONTRACT OR SALE, AND ANY NEGOTIABLE INSTRUMENT EXECUTED BY YOU WILL BE RETURNED WITHIN TEN (10) BUSINESS DAYS FOLLOWING RECEIPT BY THE SELLER OF YOUR CANCELLATION NOTICE, AND ANY SECURITY INTEREST ARISING OUT OF THE TRANSACTION WILL BE CANCELLED.

IF YOU CANCEL, YOU MUST MAKE AVAILABLE TO THE SELLER AT YOUR RESIDENCE, IN SUBSTANTIALLY AS GOOD CONDITION AS WHEN RECEIVED, ANY GOODS DELIVERED TO YOU UNDER THIS AGREEMENT, CONTRACT OR SALE; OR YOU MAY IF YOU WISH, COMPLY WITH THE INSTRUCTIONS OF THE SELLER REGARDING THE RETURN SHIPMENT OF THE GOODS AT THE SELLER'S EXPENSE AND RISK.

IF YOU MAKE THE GOODS AVAILABLE TO THE SELLER, AND THE SELLER DOES NOT PICK THEM UP WITHIN TWENTY (20) DAYS OF THE DATE OF YOUR NOTICE OF CANCELLATION, YOU MAY RETAIN OR DISPOSE OF THE GOODS WITHOUT ANY FURTHER OBLIGATION. IF YOU FAIL TO MAKE THE GOODS AVAILABLE TO THE SELLER, OR IF YOU AGREE TO RETURN THE GOODS TO THE SELLER AND FAIL TO DO SO, THEN YOU REMAIN LIABLE FOR PERFORMANCE OF ALL OBLIGATIONS UNDER THE CONTRACT.

TO CANCEL THIS TRANSACTION, MAIL OR DELIVER A SIGNED AND DATED COPY OF THIS CANCELLATION NOTICE OR ANY OTHER WRITTEN NOTICE, OR SEND A TELEGRAM TO 801 Hiawatha Blvd. East, Syracuse, NY 13208 OR FAX TO 315-424-6887 NOT LATER THAN MIDNIGHT OF: (3RD BUSINESS DAY AFTER DATE OF 7/3/12 CONTRACT).

I HEREBY CANCEL THIS TRANSACTION

Client Signature \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Client Signature \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_



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## Appendix C – Energy Assessment

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Advisor's Name: \_\_\_\_\_ Date: / / 2011

HomeOwner's Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ NY Zip: \_\_\_\_\_

House Type: Cape Colonial Ranch Split Raised Ranch Bungalow

Heated Floors: 1 Occupants: 2 Bedrooms: 4

Basement: \_\_\_\_\_ Condition: \_\_\_\_\_ Const. Year: 1963

Heated Basement: \_\_\_\_\_ Moisture: Yes or No Thermostat Prog: Yes or No

Exhaust Fans: \_\_\_\_\_

Fan Location 1: \_\_\_\_\_ Fan Location 2: \_\_\_\_\_ Fan Location 3: \_\_\_\_\_

Conditioned Area and Volume Calculation

L x W = Area x H = Volume

Basem't	x =	x =
	x =	x =
	x =	x =
1st Floor	x =	x =
	x =	x =
	x =	x =
2nd Floor	x =	x =
	x =	x =
	x =	x =
3rd Flr	x =	x =
	x =	x =
	x =	x =

35 X ( 15704 Volume) / 60 X ( 19 N Factor) = 1821 MVG

MVG X .7 = 1274 MVG

TOTALS \_\_\_\_\_ sf

IVAC & DHW	HV Unit 1	HV Unit 2	DHW Unit1	DHW Unit2	Baseline Reading:	<u>-22</u>
Location	<u>Base</u>		<u>Base</u>		Worst case reading	<u>-32</u>
Fuel Type	<u>NG</u>		<u>NG</u>		Adjusted WCD:	<u>-10</u>
Year Installed	<u>2008</u>		<u>2008</u>		Ambient CO:	<u>0</u>
TU IN	<u>90K</u>		<u>40K</u>		CAZ CO:	<u>0</u>
Condition	<u>Good</u>		<u>Good</u>		Temp In:	<u>73</u>
Unit Type	<u>D/N</u>		<u>ATM</u>		Temp Out:	<u>55</u>
Model	<u>24</u>		<u>15</u>		Dishwasher: Make & Age	Old or New
Water Pressure	<u>D/N</u>		<u>-33</u>		Clothes Washer: Make & Age	Old or New
Appl. Type	<u>WFA</u>				Refrigerator: Make & Age	TF SS BF Old or New
Filter/EIC	<u>EIC</u>				Elec or Gas Dryer Vented	<u>Properly</u> Improperly None
Efficiency	<u>92%</u>		<u>50%</u>		Gas or Elec Oven CO	
Drillage P/F	<u>D/N</u>		<u>P</u>		Range Vented	Yes <u>No</u>
HW Orphan			<u>Yes</u>		Co Detector	<u>Yes</u> No
HW Size			<u>506</u>		Gas Leak Test	Passed <u>Failed</u>
Central AC	AC Unit 1	AC Unit 2				
Year Installed	<u>2006</u>					
EER	<u>13</u>					
TU or TON	<u>2.5</u>					
Blower Door	HP	FP	Ring	CFM50	Basement Door	
	<u>-50</u>		<u>None</u> A B C	<u>2675</u>	Open or Closed	
			None A B C		Open or Closed	

BPI Draft Requirements

0 °F -2.5	35 °F -1.9	70 °F -1.0
5 °F -2.5	40 °F -1.8	75 °F -0.9
10 °F -2.5	45 °F -1.6	80 °F -0.8
15 °F -2.4	50 °F -1.5	85 °F -0.6
20 °F -2.3	55 °F -1.4	90 °F -0.5
25 °F -2.1	60 °F -1.3	95 °F -0.5
30 °F -2.0	65 °F -1.1	100 °F -0.5

BPI Allowable Worst Case

Orphan Water Heater	-2
Boiler or Furnace w/DHW	-3
Boiler or Furnace w/VD & DHW	-5
Boiler or Furnace Only	-5
MA Boiler or Furnace w/DHW	-5
MA Boiler or Furnace Only	-15
MA DHW Only	-15

Stories	N Factor	Appliance Type	Vent Type
1	19	WFA = Warm Forced Air	
1.5	16.8	= Gravity Air	ATM = Atmospheric
2	15.4	= Hot Water Boiler	ID = Induced
2.5	14.4	= Steam Boiler	DV = Direct Vent
3	13.7	= Heat Pump	SC=Sealed Combustion



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## Appendix D – Homeowner Construction Agreement

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This Agreement is made the 29<sup>th</sup> day of JUNE, 2012 between GreenHomes America, LLC (the "Contractor") and the Client:

CLIENT NAME <u>THOMAS &amp; SANDY LUTZ</u>	HOME TELEPHONE	WORK TELEPHONE <u>716 572 5646</u>
ADDRESS <u>819 NOTTINGHAM RD.</u>	WORK SITE LOCATION IF DIFFERENT	
CITY <u>SYRACUSE</u>	STATE <u>N.Y.</u>	ZIP <u>13224</u>
		Site Phone: _____

Client is the:  Homeowner  Authorized Agent of Property Owner  Cooperative Shareholder Owner

Starting Date APPROX. 2-4 WKS. Substantial Completion Date \_\_\_\_\_ Completion Date \_\_\_\_\_

Work Description (attach additional sheets if needed): INCLUDES ALL MEASURES OF NYSEDA DER PROGRAM ALL PER WORKSCOPES ATTACHED PG 1-7.

Guarantee: The work described above shall be covered by the following guarantee(s) as indicated below (for any guarantee to apply, the associated box must be checked and both parties must initial in the spaces provided):

25% Energy Savings Guarantee  Total Comfort Guarantee  Property Protection Guarantee  
 HVAC Temperature Guarantee  No Guesswork Guarantee  Ultimate Assurance Guarantee

Payment: Client agrees to pay Contractor \$ 75,990 (Agreement price) SEVENTY FIVE THOUSAND NINE HUND NINETY DOLLARS. for the materials, labor and services to be provided as described above.

Down Payment: \$ 15,000 upon approval of this agreement. \*NOTE: Down-Payments Deposited at: Wachovia Bank, Charlotte, NC.

Full Payments: \$ \_\_\_\_\_ upon substantial completion of performance by Contractor.

Progress Payments: The Contractor shall be entitled to receive payment from client for the reasonable value of materials and labor to be provided and expenses incurred upon the Agreement in accordance with the following schedule:

\$ 37,500 as payment for the following materials, labor and services (identify the state of completion of the work to be performed): \_\_\_\_\_

FROM NYSEDA DER PROGRAM

\$ 8,000 as payment for the following materials, labor and services (identify the state of completion of the work to be performed): ON COMPLETION OF ATTIC & BASEMENT INSULATION // \$15,490 DUE UPON COMPLETION OF SIDING.

**Notices:**

1. CLIENT MAY CANCEL THIS TRANSACTION ANY TIME PRIOR TO MIDNIGHT ON THE THIRD BUSINESS DAY AFTER THE DATE OF THIS AGREEMENT. SEE THE ATTACHED "NOTICE OF RIGHT TO CANCEL" FORM FOR AN EXPLANATION OF THIS RIGHT.

2. Client and Contractor expressly agree that the contents of this Agreement, subject to the terms and conditions stated on the face, the back and any attachments to this document, comprise the complete, exclusive and mutual understanding of the corresponding obligations of the parties. No oral assertions, representations or descriptions of work to be performed shall be binding on either party. **THIS AGREEMENT SHALL NOT BECOME BINDING UPON THE CONTRACTOR UNTIL IT IS ACCEPTED BY AN AUTHORIZED MANAGER OF THE CONTRACTOR.** By executing this Agreement, Client acknowledges that Client has read its terms and conditions, and further understands and agrees to perform Client's obligations hereunder; and acknowledges that Client has received a true copy of this Agreement. In the event this transaction is financed, all financing documents shall be considered a part of this Agreement.

3. Failure to tender payment to a performing Contractor or Subcontractor may subject Client's property to applicable liens by the Contractor or Subcontractor in order to enforce payments.

**Client Acceptance**

**GreenHomes America, LLC Acceptance**

Client Sandra H. Lutz Date 6/29/2012

Advisor \_\_\_\_\_ Date 6/29/12

Client Thomas G. Lutz M.D. Date 6/29/2012

Authorized Manager [Signature] Date 6/29/12



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## Appendix E – Stamped Letter for Permitting

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## Summary

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The analysis of the wall section and other relevant members was done using ASD equations from the 2001 NDS and Manual for Engineered Wood Construction. The following modes of failure were all considered:

1. Failure of 2 x 4 studs in compression
2. Failure of mechanical connection of ledger board to rim joist
3. Failure of ledger board in shear
4. Failure of ledger board in flexure
5. Failure of mechanical connection of ledger board to FCB 43.5
6. Failure of mechanical connection of FCB43.5 to stud



For each of the wall section parameters:

1. Vinyl, fiber cement, and stucco siding (windows were approximately the same psf as stucco)
2. Studs at 16" and 24" o.c.

## Methods of Analysis

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### Failure of 2 x 4 studs in compression

The dead loads of each wall section in question were calculated using a tributary area (equal to that of a stud bay) and multiplied by a conservative estimate of what the wall section would weight in pounds per square foot (psf). The minimum capacity of axial compression for 2 x 4 x 8 structural lumber was selected from table 5.2a of the ASD structural lumber supplement (because the actual species of wood was unknown). The appropriate correction factors (load duration, temperature, etc.) were looked up in the NDS and multiplied by the given capacity. The dead load in each stud, in each wall scenario, were tabulated and tested against the allowable axial compression load.

### Failure of mechanical connection of ledger board to rim joist

Allowable shear for SDWS22400DB screws were given by Simpson Strong Tie technical data. The wood side member thickness was estimated as 2 1/2" (as opposed to the actual 1 1/2") because the screw also needed to travel through existing siding before penetrating the main member. Because the species of the wood was unknown, again, the minimum allowable load was used. All applicable correction factors were multiplied. The resulting corrected allowable load was divided by the previously calculated dead load. This ratio was used multiplied by the width of stud bay in order to calculate the minimum spacing of screws needed to attach the ledger board. (Common sense was used in order to round the number down to something reasonable. For example, asking someone to install screws at a spacing of 25 1/4" is unreasonable. Instead a spacing of 24" was used.)



## Failure of ledger board in shear and in flexure

The ledger board was idealized as a simply supported beam with a span of the calculated spacing of the screws into the rim joist. (Although this does not realistically describe the axial deflection of the ledger board it is adequate to describe the maximum shear and bending moment between screws.) Because it was impossible to anticipate where exactly the loads would be transferred into the ledger (this is dependent on installation and where studs connect to ledger) the configuration of loads was placed where they would cause the maximum shear and maximum moment. The calculated maximum shear and moments were then tested against the corrected allowable shear and moments. Allowable shear and moments for 2 x 4 structural lumbers were looked up in table 5.4a of the ASD structural lumber supplement.

## Failure of mechanical connection of ledger board to FCB 43.5 and mechanical connection of FCB 43.5 to stud

Both connections were analyzed using yield limit mechanics. The values for dowel bearing strengths of wood are from table 11.3.2 of the NDS. The yield bending strength of Strong-Drive SD screws came from the ICC-ES Evaluation Report. The bearing strength of the FCB 43.5 fixed clip was estimated as 33ksi (yielding stress of low grade steel). All yield modes involving crushing of the wood and/or plastic yielding of the screw were considered (I<sub>m</sub>, III<sub>m</sub>, IV); yield modes involving crushing of the steel plate were ignored because of its much higher yield stress (33ksi >> 3ksi). Calculated values were higher than measured technical data (ICC-ES), therefore measured data was used. The reference lateral design value (Z) was then multiplied by the appropriate correction factors, and the number of screws in the connection. All values were higher than any estimated dead load.

Fastener withdrawing was considered negligible because the load is primarily in shear (With the exception of a small bending moment in the ledger board) and because the grooves in the screw will resist withdraw.

## Conclusions

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### Is 4" an adequate screw length? How do we fasten the ledger board?

Four inches is an adequate screw length. All spacing calculations for ledge board are based on a screw length of four inches.

Based on the calculations, walls with stucco and ledger board beneath a window need a minimum spacing of 2' between screws. With fiber cement siding or vinyl siding screws can be spaced 5'-6' apart, with the exception of underneath windows.



## Are the clips adequate to hold windows/walls?

Yes. The clips were made to be used in conjunction with steel and when done so can produce wall connections that withstand thousands of pounds. Simpson Strong Tie technical data suggests a minimum allowable load of 550 lbs when fastened to wood with 4 SD10112 screws. Based on yield limit theory and the ICC-ES measured value of yield bending strength for SD10 screws a structural lumber to FCB 43.5 connection was estimated to hold up to 680 lbs. The largest dead load was estimated to 172 lbs. The clip connected with only two screws can hold 248.4 lbs.

## How do we space the studs?

The studs are much more than adequate in compression when spaced at 24" apart. No further analysis was done because I can't imagine cladding manufacturers would still offer a warranty to stud bays as wide as 4'.

## Sample Calculations

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Although most of the calculations were done in an excel spreadsheet calculations were done by hand in order to check against the spreadsheet. These are provided at the end.



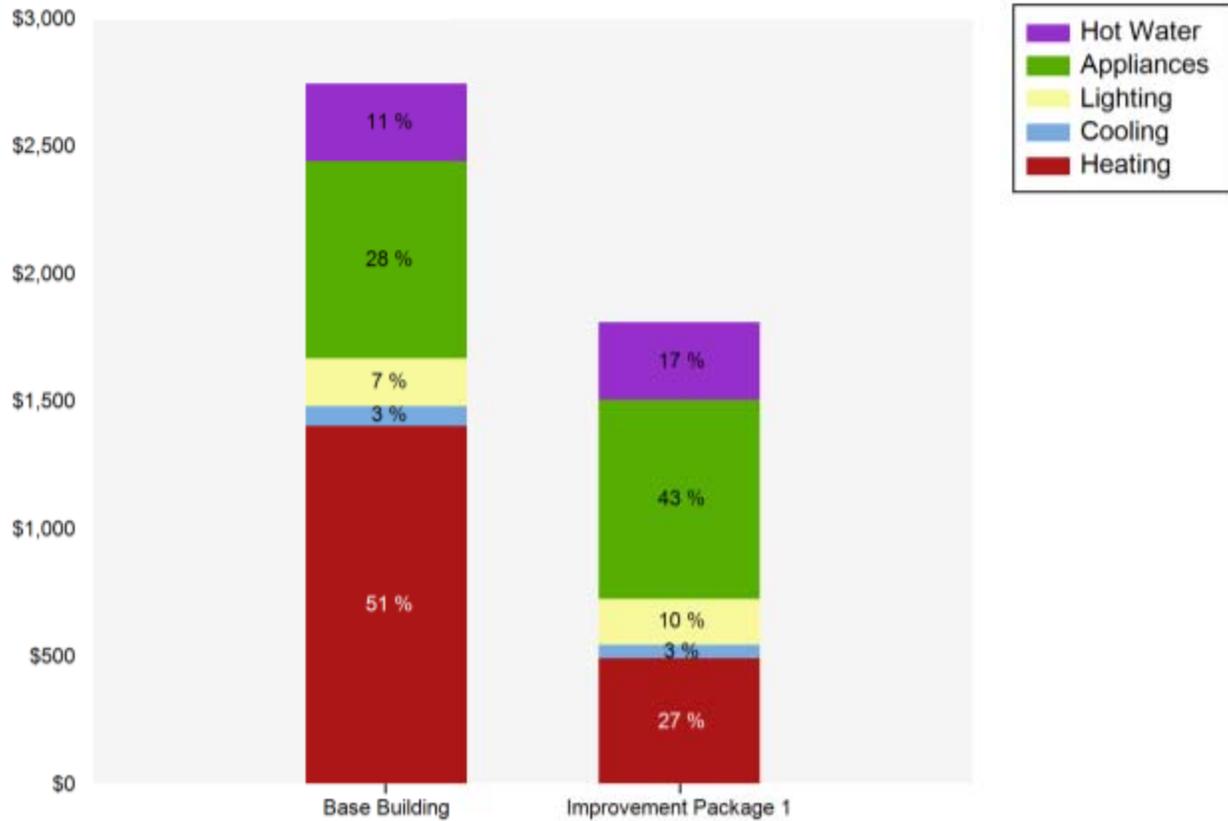
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## Appendix F – TREAT Modeling Report Results

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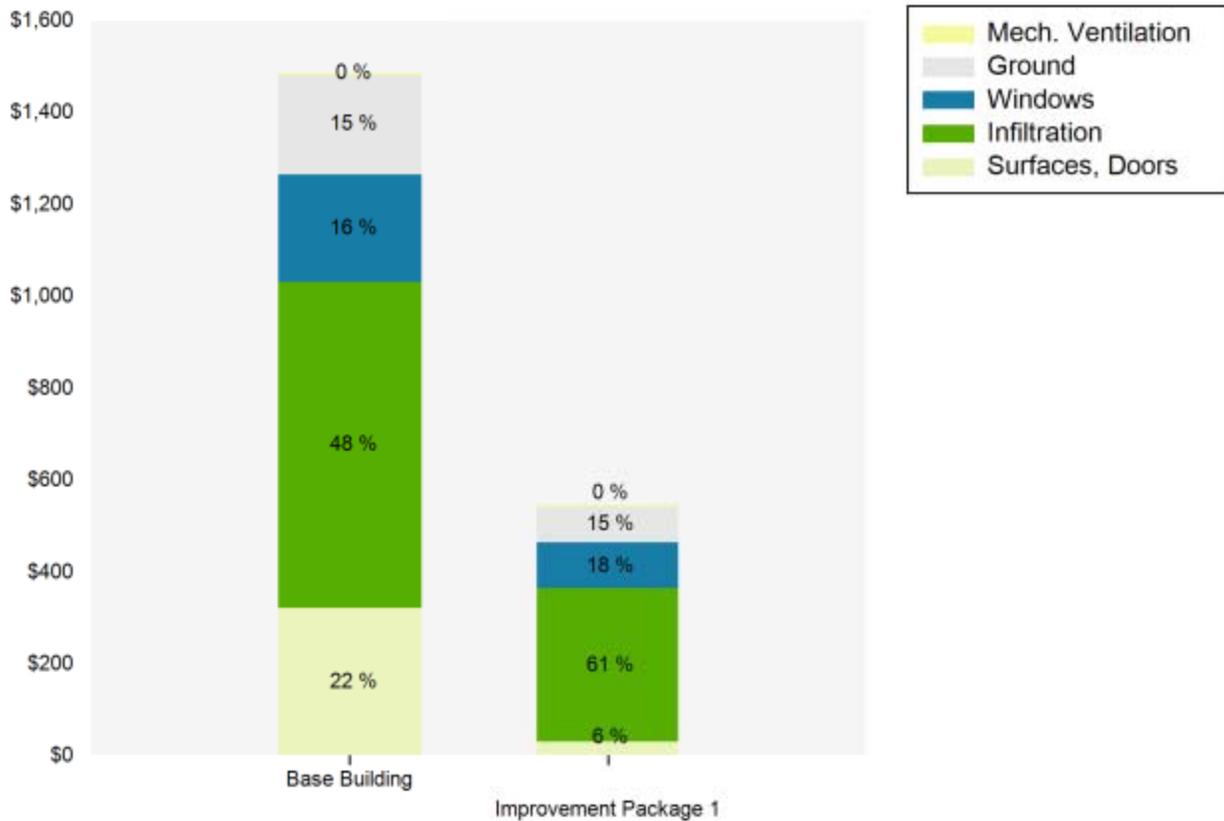
## Model Energy Comparison

### Total Annual Energy Bill by Category



	Base Building	Improvement Package 1	Savings
Heating	\$1,409	\$494	\$915
Cooling	\$77	\$53	\$24
Lighting	\$184	\$184	\$0
Appliances	\$773	\$773	\$0
Hot Water	\$304	\$304	\$0
<b>Total</b>	<b>\$2,748</b>	<b>\$1,809</b>	<b>\$939</b>

### Annual Heating/Cooling Bill by Category



	Base Building	Improvement Package 1	Savings
Surfaces, Doors	\$323	\$31	\$292
Infiltration	\$709	\$332	\$376
Windows	\$233	\$99	\$133
Ground	\$221	\$84	\$137
Mechanical Ventilation	\$1	\$1	\$0
<b>Total</b>	<b>\$1,486</b>	<b>\$548</b>	<b>\$939</b>

**Notes:**

1. Costs for annual heating/cooling bills are calculated by taking the combined heating and cooling loads and multiplying by the average cost per BTU of heating and cooling fuel use. Differences in load profile or HVAC system efficiencies are not accurately reflected in this report.



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## Appendix G – Construction Log Example

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## NYSERDA Deep Energy Retrofit : Construction Daily Log

<b>Residence Name :</b>	
Date:	
Weather:	
How many contractors on site:	
How many hours worked on site:	
Primary Strategy (SPF/XPS):	

<b>Picture Checklist</b>	
North Elevation	
East Elevation	
South Elevation	
West Elevation	
Any Demo	
Any New Details	
Any Lessons Learned	
New Installations	

	Questions	Observation
On Site Questions	Was there any Demo done today? If so what?	
	What areas of the house were worked on today?	
	Did you come across anything that should be a lesson moving forward?	
	What parts/details were newly installed today ?	
	What manufacturers worked on the job today or delivered materials to site?	
	Is there anything that was constructed today that took less time or more time than expected?	
	Were there any visitors to the site today? If so who, and why?	
	Any testing done on site today? Results?	



## Appendix H – Materials List

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# House 1 Project Material Quantities and Costs

## Project Summary

Purchased Materials	
WALL Construction Materials	\$9,483.04
WINDOW Construction Materials	\$8,866.03
ATTIC Construction Materials	\$279.86
BASEMENT Construction Materials	\$576.08
HVAC Construction Materials	\$594.55
ERV Construction Materials	\$1,094.68
<b>TOTALS</b>	<b>\$20,894.24</b>

Donated Materials	
WALL Construction Materials	\$5,672.55
WINDOW Construction Materials	\$0.00
ATTIC Construction Materials	\$980.00
BASEMENT Construction Materials	\$1,991.87
HVAC Construction Materials	\$0.00
ERV Construction Materials	\$0.00
<b>TOTALS</b>	<b>\$8,644.42</b>

Purchased & Donated Materials	
<b>TOTAL Purchased Materials</b>	<b>\$20,894.24</b>
<b>TOTAL Donated Materials</b>	<b>\$8,644.42</b>
<b>TOTAL MATERIALS</b>	<b>\$29,538.66</b>



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## Appendix I – Costing Information

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# Lutz Project Wall Cost Estimates vs Actuals

Wall Work	Contract Amount	Contract Amount per SF	Estimate of Donated Material	Net Contract Amount	Total Actual	Donated Material	Total Actual w/ Donated Material	Actual % vs Projected	Actual Cost/sf
Remove Siding	\$0	\$0.00	\$0	\$0	\$1,534	\$0	\$1,534	NA	\$0.70
New Framing	\$6,874	\$3.14	\$2,100	\$4,774	\$4,391	\$1,234	\$5,625	81.8%	\$2.57
Remove windows	\$0	\$0.00	\$0	\$0	\$671	\$0	\$671	NA	\$0.31
Window Trim	\$4,050	\$1.85	\$0	\$4,050	\$3,606	\$0	\$3,606	89.0%	\$1.65
Spray foam	\$8,198	\$3.75	\$3,838	\$4,360	\$3,263	\$3,935	\$7,198	87.8%	\$3.29
Install T-ply	\$3,279	\$1.50	\$0	\$3,279	\$3,717	\$0	\$3,717	113.3%	\$1.70
Box bottom	\$2,186	\$1.00	\$0	\$2,186	\$1,167	\$0	\$1,167	53.4%	\$0.53
<b>TOTALS (W/O Siding)</b>	<b>\$24,587</b>	<b>\$11.25</b>	<b>\$5,938</b>	<b>\$18,649</b>	<b>\$18,350</b>	<b>\$5,169</b>	<b>\$23,518</b>	<b>95.7%</b>	<b>\$10.76</b>

<b>Install siding</b>	<b>\$14,767</b>	<b>\$6.76</b>	<b>\$0</b>	<b>\$14,767</b>	<b>\$18,574</b>	<b>\$0</b>	<b>\$18,574</b>	<b>125.8%</b>	<b>\$8.50</b>
<b>TOTALS (W/ Siding)</b>	<b>\$39,354</b>	<b>\$18.00</b>	<b>\$5,938</b>	<b>\$33,416</b>	<b>\$36,924</b>	<b>\$5,169</b>	<b>\$42,093</b>	<b>107.0%</b>	<b>\$19.26</b>



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## Appendix J – Homeowner Monitoring Agreement

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## Agreement to Permit Monitoring and Access to Premises:

THIS AGREEMENT TO PERMIT MONITORING AND ACCESS TO PREMISES (this "Agreement") is dated and effective June 29, 2012 and is entered into by and between IBACOS, INC., a Pennsylvania corporation ("IBACOS") and THOMAS and SANDRA LUTZ ("Homeowner").

### BACKGROUND

A. The Homeowner is the rightful property owner of a residential house located at 819 NOTTINGHAM RD, SYDRAUSE, NY 13277 (the "House") to be upgraded by GreenHomes America, Inc. ("Contractor"). The Contractor, under a separate agreement with IBACOS, has incorporated certain building materials and products (collectively, "Products") into the energy retrofit upgrade construction of the House which are technologically innovative and/or energy efficient. This was done as part of Contractor's participation in the "Building America Program" of the United States Department of Energy ("DOE"), in conjunction with DOE's research contractor, IBACOS.

B. In order to evaluate the performance of the Products, the Contractor has agreed to have IBACOS equip the House with monitoring instruments and devices ("Monitors"), which will measure several building performance parameters, including but not limited to: thermal, comfort, and energy performance of the House and Products.

C. It may be necessary for employees and/or contractors ("Representatives") of the Builder, DOE and/or IBACOS to access the House during the Monitoring Period to test, inspect or repair the Monitors, and to remove the Monitors at the end of the Monitoring Period.

### AGREEMENT

Therefore, IBACOS and the Buyer agree to the following:

1. The Homeowner agrees to allow IBACOS to collect data with the Monitors for a period of at least one (1) year but not longer than two (2) years from the date of final activation of the Monitors (the "Monitoring Period"). Homeowner agrees that IBACOS may release building performance results based on analysis of this data publicly, provided that IBACOS shall not disclose the exact street address of the House, the Homeowner's name, or any data or results that the Homeowner might reasonably wish to be held confidential.



**Host Site Agreement:**

The service and equipment for TOM & SANDY LUTZ being provided by GREENHOMES AMERICA as part of your participation in this DER demonstration project is funded, in part, by the New York State Energy Research and Development Authority (NYSERDA).

TOM & SANDY LUTZ agrees to hold harmless NYSERDA, its agents and employees, and the State of New York against loss or expense, including legal fees, from any and all claims, demands, losses, causes of action, damage, lawsuits and judgments, including attorney fees and costs arising out of or in consequence of this agreement.

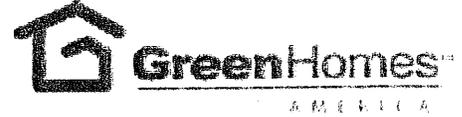
**Photo Release Form:**

I hereby give my consent for IBACOS/NYSERDA/Green Homes America to use my photograph and likeness in all forms and media for marketing, reporting, advertising, trade and any other lawful purposes.

THOMAS LUTZ & SANDRA LUTZ  
Name (Please Print)

Thomas Lutz M.D., Sandra H. Lutz  
Signature

6/29/2012  
Date



2. Homeowner recognizes and agrees that the Monitors will remain in the House for the Monitoring Period, and Homeowner grants Contractor and IBACOS a license to so locate the Monitors. Prior to selling or leasing the House to any third party during the Monitoring Period, Homeowner will notify IBACOS, and facilitate the transfer of this Agreement to any future owner or lessee of the House.

3. Homeowner will permit the Representatives to enter the House and access the Monitors during the Monitoring Period, upon reasonable notice to Homeowner and at a time convenient to Homeowner, for the purpose of inspecting, replacing, repairing or removing the Monitors.

4. At the end of the Monitoring Period, IBACOS will remove (or require the Representatives to remove) the Monitors from the House.

5. IBACOS shall be responsible for and shall repair in a timely fashion any and all damage to the House caused by the Monitors, the Representatives, or the installation or removal of the Monitors, except to the extent any such damage is caused by Homeowner or Homeowner's invitees.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

IBACOS, Inc.:

HOMEOWNER:

*Sandra M. Lutz*  
Signature

*Thomas G. Lutz M.D.*  
Signature

SANDRA M. LUTZ  
Printed Name

THOMAS G. LUTZ M.D.  
Printed Name



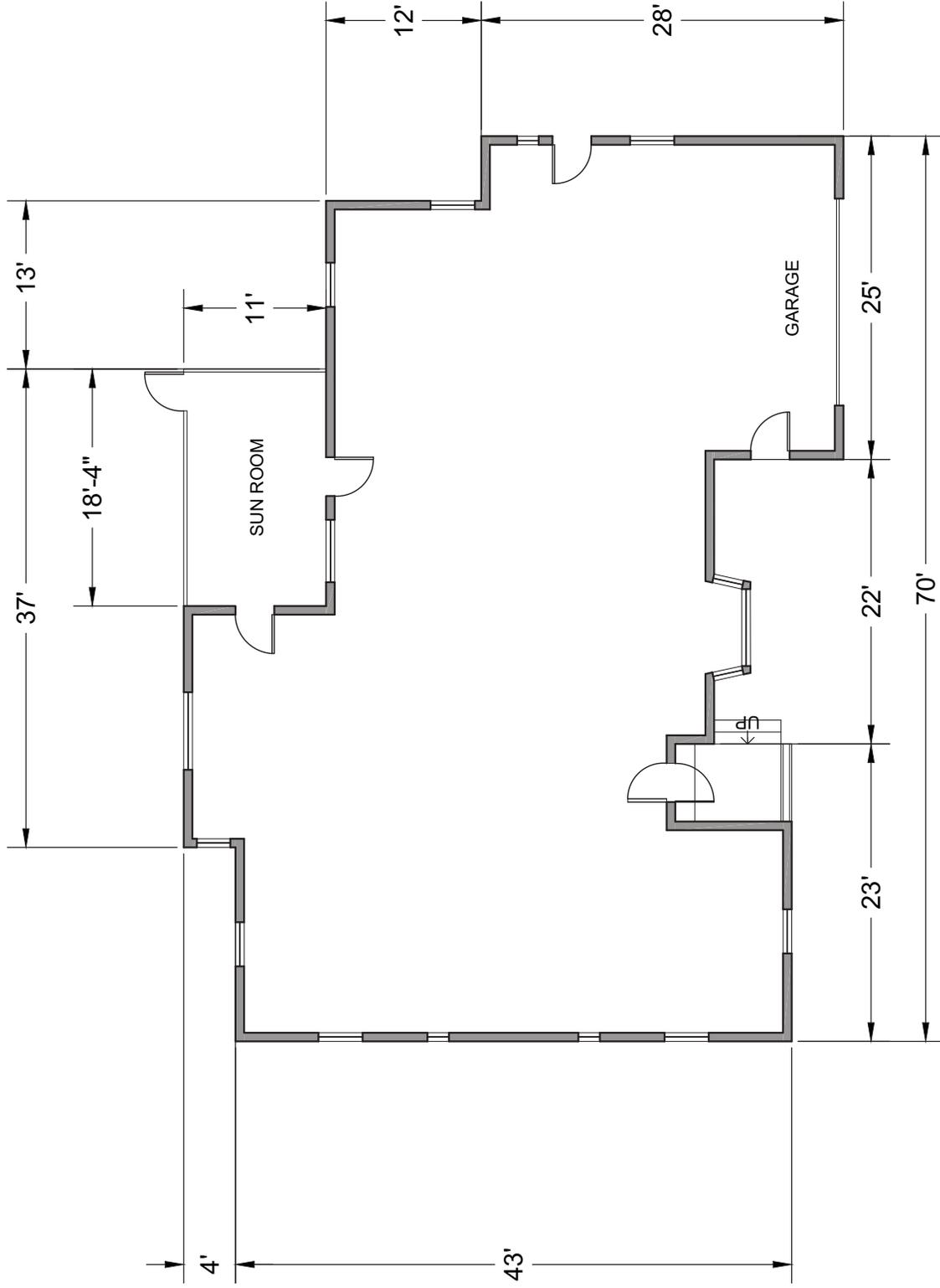
NYSEERDA Deep Energy Retrofits:  
House 1 Report  
Exterior Spray Foam Retrofit Strategy  
November 7, 2012

## Appendix K – Floor Plans and Elevations

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NYSERDA RETROFIT SOLUTIONS: LUTZ RESIDENCE

FLOORPLAN



2214 Liberty Avenue  
Pittsburgh, PA 15222  
412.765.3664  
Fax 412.765.3738

Project: PROJECT LUTZ RESIDENCE  
Date: DATE  
Scale: SCALE  $\frac{3}{16}$ " = 1'-0"

Detail number:

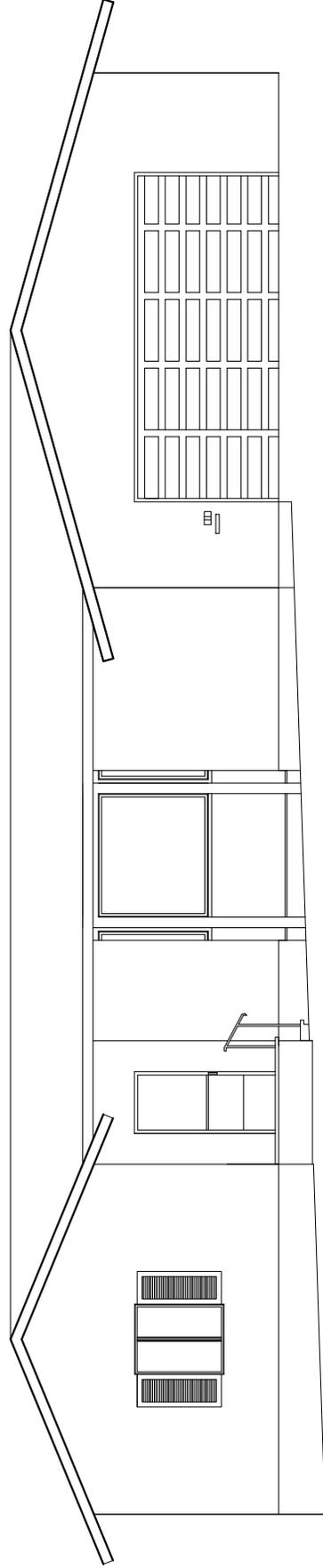
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NYSERDA RETROFIT SOLUTIONS: LUTZ RESIDENCE

FRONT ELEVATION

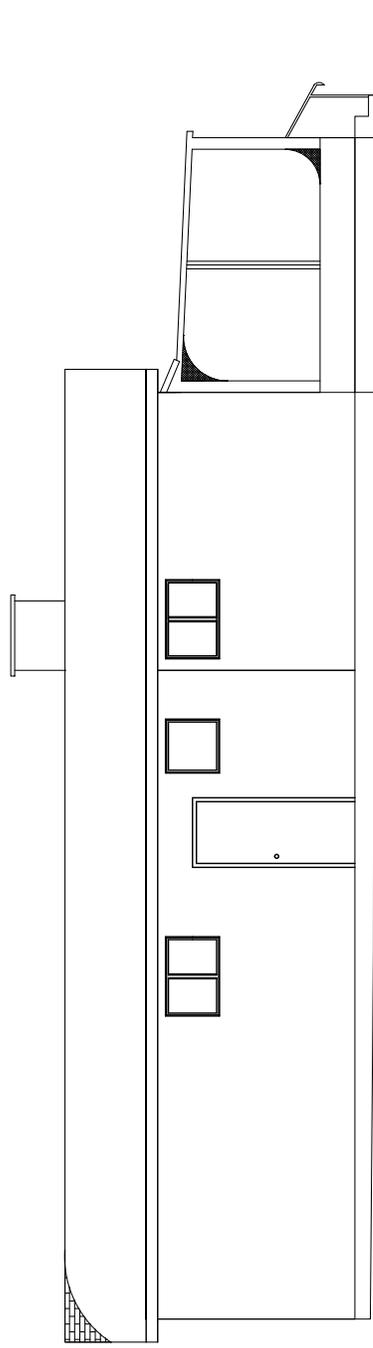


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Project: PROJECT LUTZ RESIDENCE  
Date: DATE  
Scale: SCALE  $\frac{3}{16}'' = 1'-0''$

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PROJECT LUTZ RESIDENCE

Project: DATE  
Date: SCALE

SCALE  $\frac{3}{16}$ " = 1'-0"

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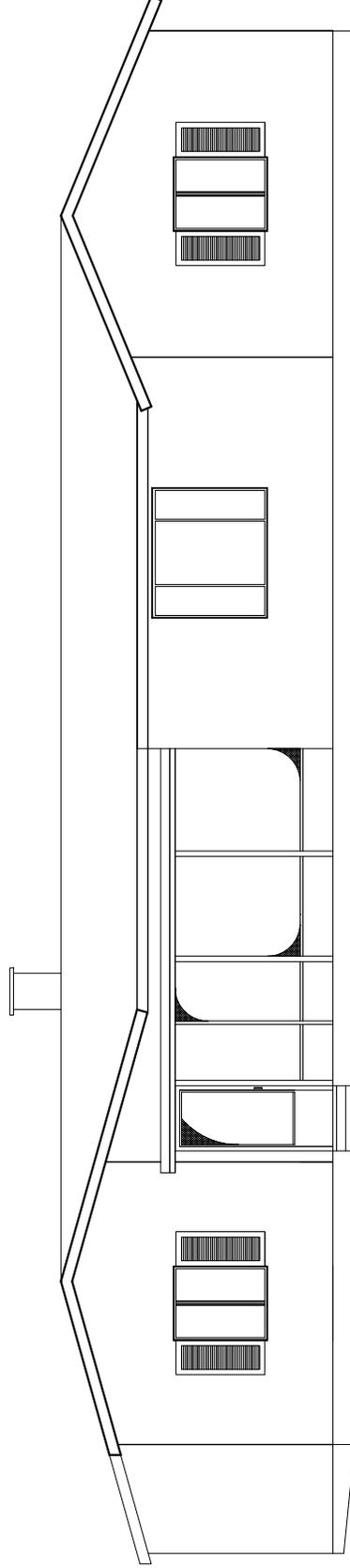
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NYSERDA RETROFIT SOLUTIONS: LUTZ RESIDENCE

REAR ELEVATION



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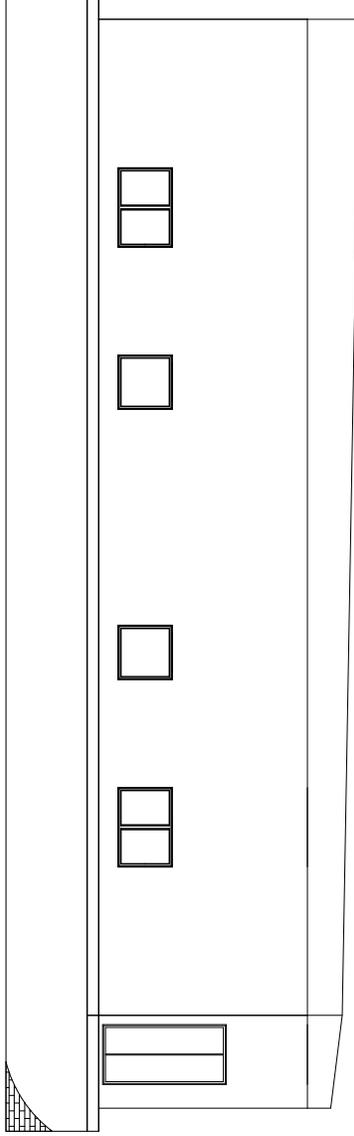
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Date: DATE  
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Detail number:  
Detail page:  
VERSION  
Detail page:

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NYSERDA RETROFIT SOLUTIONS: LUTZ RESIDENCE

ELEVATION\_LEFT



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Date: DATE

Scale: SCALE

$\frac{3}{16}'' = 1'-0''$

Detail Number:

VESSON

Detail Page:

Booklet Page: