



High Performance Project



3 Sisters Project Ft. Worth

3 Sisters Project Ft. Worth



Participant information

Ferrier Builders
Heather Laminack
5017 Byers Ave
Fort Worth, TX 76107

Phone: 817-237-6262

Email Address: heather@ferriercustomhomes.com

Website: www.ferriercustomhomes.com

Category

Single Family Homes (under 3,000 sq ft.)

High Performance: Yes

Project information

3 Sisters Project
Fort Worth, TX 76107

Date Completed: 06/07/2018

Dimensions of building (all floors of multi-story building):

1st floor 54'x20'

2nd floor 61'x20'

Total sq. ft. of conditioned space: 1,950sf

Built By:

Ferrier Builders
Heather Laminack
5017 Byers Ave
Fort Worth, TX 76107

Panels Manufactured By

Company Name: FischerSIPS



Designed By (if different than applicant:

Daniel Van Kunschik
Ferrier Builders
4748 Slippery Rock Drive
Fort Worth, TX 76123

3 Sisters Project Ft. Worth



Total sq. ft. of conditioned space: 1,950sf

Describe the end use of the building: single family residence

How did SIP construction help you get this job?

Owners sought us out specifically because they wanted to incorporate SIP's into their project.

SIP wall thickness and core material: 4" wall panels, 6.5" wall panels at stair wall. EPS core

SIP roof thickness and core material: 6" roof panels. EPS core

Describe the benefits of using SIPs on this project. Did SIPs help save time, labor, construction costs, or energy?

SIP's were incorporated into the project's design from the very beginning, as the owners desired the high performance aspects derived from SIP's (extreme air tightness, great insulation & incredible strength with its reduced homeowners insurance premiums). Install went quickly, and the SIP's walls & roof contributed to an extremely tight home envelope, which eventually resulted in a HERS score of 9.

Describe any innovative design elements or structural engineering involved:

This home is the first of three very similar homes. We had a buildable lot size of 21' wide and the owner desired a modern look for all three homes. The design also called for a single slope roof & a lot of windows for ample daylighting. The placement of the windows created a challenge to obtain the proper Shear wall strengths. SIP's contributed greatly to the needed increased Shear Wall strength, and when coupled with extra structural anchors in the concrete slab, exceeded the requirements. SIP's were the ideal choice for the single slope roof. Simplifying the roof erection on very tight space and giving us an excellent platform for our highly reflective standing seam Galvalume metal roof.

Please list any certifications the project received, such as ENERGY STAR, LEED, National Green Building Standard, WELL, Passive House, Green Globes or local green building programs. Only list certifications that are completed:

ENERGY STAR v3.1, Department of Energy Net Zero Energy Ready Program, Water Sense, Fortified Home

HERS Index (required only for High Performance Category and recommended for residential projects): 9

Blower door test results (ACH50) (required only for High Performance Category and recommended for residential projects): 1.9

Describe the HVAC system used on the project:

15 SEER 3 ton heat pump, 8.5 HSPF. 3 ton air handler unit (for 1950sf living space & large vaulted center section) above second floor bathroom. Ducts installed in open web floor trusses or 2nd floor flat ceiling areas & with exposed metal spiral ducts in center vault area. Includes 2 zone damper system and Panasonic 50 CFM spot ERV.

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Describe any other energy-saving materials used in the building envelope other than SIPs. List U-values of windows used and the U or R-value of any insulation materials. (judged only for High Performance Category)

Anderson 100 windows (u-value 0.27, SHGC 0.19) and fiberglass insulated exterior doors (R-6.0), all ducts located in conditioned envelope, detached garage insulated with spray foam insulation

Please list any energy-efficient products or design features, such as lighting, hot water heating, appliances, passive solar (judged only for High Performance Category):

Passive solar design on an urban infill lot: the lot primarily faces east and west, creating a challenge. We incorporated a Passive solar design by eliminating all west windows (our biggest enemy of energy efficiency) except for 6 very small rectangular units. The largest are completely shaded by an existing pecan tree. We provided ample daylighting by use of east, south and north windows. The large east windows created too much heat gain during our hot summer months, so we mitigated that by use of carefully sized metal awnings. This allows the cooler morning sun to shine directly into the living space but keeps the hot sun out by 10AM. The south windows are also shaded by computer-sized awnings, which allow the warm winter sun into the living space while keeping the hot summer sun out. Highly reflective Galvalume standing seam roof & wall panels on west side of home, 100% ENERGY STAR appliances, (1) Steibel Eltron electric tankless water heater with 0.99 energy efficient factor, ENERGY STAR LED lighting throughout home, ENERGY STAR ceiling fans in living & bedrooms, all plumbing fixtures are low-flow Water Sense compliant and within a maximum 20' of water supply line

Were any solar panels installed on the project? If so, indicate the size of the system (judged only for High Performance Category):

Yes, 4.88 kW PV system (panel layout included as a supplement to application)

Please list any sustainable materials or design features not listed above, such as recycled materials, low-VOC finishes, landscaping, etc. (judged only for High Performance Category):

SITE: infill with high density (3 homes on a 92' wide x 124' long lot), native adapted (low water need) landscaping & turf grass (side note: landscaping plan was created by local university as part of their sustainable landscaping program), pervious walkways around perimeter of home & pervious alley leading to garage entry. NATURAL RESOURCES: Preserved the native trees & protected non-construction areas. RESOURCE EFFICIENCY & RECYCLED CONTENT/RENEWABLE MATERIALS: Stacked stories, SIP's (sustainable OSB reduces lumber used on project), interior walls framed with Advanced Framing, renewable wood materials, framing layout and structural SIP and framing plans, prefabricated open web floor trusses, James Hardie fiber cement exterior siding with recycled content (with locally supplied sand & cement in a local plant), reclaimed hardwoods installed on second floor from dwelling that was previously located on that property, locally sourced Shou Sugi Ban wood for rain screen and balcony and handrail, Trex decking contains recycled content, high recycled content standing seam roof, recycled content steel posts, concrete foundation of house was simply sealed (no added flooring) as final floor finish, concrete in foundation, garage approach and sidewalks contained local cement, sand & gravel, quartz countertops (recycled material), pre-finished windows/exterior sliding door/galvalume metal roof/Trex decking/Tamilyn Extreme Trim. Separate dumpster to recycle all wasted wood. Recycled cardboard, paper & metal. Life Cycle Analysis of SIP's, roofing, siding, steel awnings, James Hardie vertical siding & Tamilyn Extreme Trim. INDOOR AIR QUALITY: detached garage, no fireplace, hard surface flooring, no carpet in home, formaldehyde-free cabinetry, non-toxic pest control, all paints & stains used on interior of home were low or no VOC content, return air ducts in all bedrooms, properly sized vent-a-hood and wet area exhaust fans.

3 Sisters Project Ft. Worth



Any additional comments on the project:

Our client owned a triplex that was previously located on the property. As he approached retirement, he wanted to reinvent the property, while also providing a home for himself & his wife. As such, he hired us to oversee the demolition of existing building (and harvesting of materials that can either be reused or donated), replatting process to take it from 2 lots to 3 single family lots, variances committees with the City, design and construction of all 3 residences. His vision was that each project would be extremely energy efficient, sustainable, similar in design but still unique. As such, the projects have been dubbed the "3 sisters". The first project to be completed is the home we are applying for- the owner's personal home, the 1st sister. We have just completed construction of the 2nd sister, and negotiations are underway for the sale of the 3rd lot & construction of the home on it.

Homeowner Testimonial (taken from our Houzz page review): "We wanted a green house with about 1500 - 2000 square feet. Ferrier's team turned our dreams into reality. We love our house!"

We appreciated Ferrier's knowledge about green building and his help during the teardown of the existing buildings, the replat of the property and the design of the new house.

Ferrier sets a high standard for his sub-contractors! Subs had to satisfy not only us but the Ferrier Team!

We enjoyed the journey! Building a new house can be a daunting process. You need a professional like Ferrier!"

Front view

3 Sisters Project Ft. Worth



Interior stairwell

3 Sisters Project Ft. Worth



Interior stairwell

3 Sisters Project Ft. Worth



Interior Kitchen

3 Sisters Project Ft. Worth



Entrance

3 Sisters Project Ft. Worth



Side view

3 Sisters Project Ft. Worth



Front view

3 Sisters Project Ft. Worth



Front view

3 Sisters Project Ft. Worth



Side view

3 Sisters Project Ft. Worth











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HERS Rating

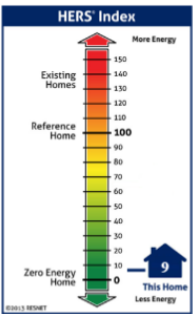
3 Sisters Project Ft. Worth





YOUR HOME WAS DESIGNED,
ENGINEERED, AND CONSTRUCTED IN
CONFORMANCE TO U.S. DEPARTMENT OF
ENERGY (DOE) GUIDELINES FOR
EXTRAORDINARY LEVELS OF
EXCELLENCE AND QUALITY.

Address:
5149 Byers Avenue , Fort Worth, TX
76107
Builder: Ferrier Custom Homes
Inspector: Fox Energy Specialists
Date: 2018-06-07



THIS HOME MEETS OR EXCEEDS THE MINIMUM
CRITERIA FOR THE FOLLOWING:

- ENERGY STAR v3
- ENERGY STAR v3.1
- 2015 INTERNATIONAL ENERGY CONSERVATION
CODE
- 2012 INTERNATIONAL ENERGY CONSERVATION
CODE
- 2009 INTERNATIONAL ENERGY CONSERVATION
CODE
- 2006 INTERNATIONAL ENERGY CONSERVATION
CODE

SAM RASHKIN, CHIEF ARCHITECT
BUILDING TECHNOLOGIES
U.S. DEPARTMENT OF ENERGY

EKOTROPE RATER - VERSION 2.2.5.2069
THIS DOCUMENT IS NOT A CONTRACT & SHALL NOT BE A SUBSTITUTE FOR ADEQUATE PROFESSIONAL SERVICES

Home Energy Rating Certificate Final Report

Rating Date: 2018-06-07
Registry ID: 982222128
Ekotrope ID: Od4K8erL



HERS® Index Score:

9 Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

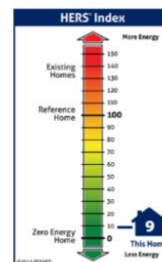
Annual Savings

\$2,685
*Relative to an average U.S. home

Home:
5149 Byers Avenue , Fort Worth, TX
76107
Builder:
Ferrier Custom Homes

Your Home's Estimated Energy Use:

	Use (MBtu)	Annual Cost
Heating	7.6	\$301
Cooling	4.8	\$193
Hot Water	4.3	\$171
Lights/Appliances	19.2	\$764
Service Charges		\$64
Generation (e.g. Solar)	29.0	-\$1,157
Total:	35.8	\$336



Home Feature Summary:

Home Type: Single family detached
Conditioned Floor Area: 1,940 sq. ft.
Number of Bedrooms: 2
Primary Heating System: Air Source Heat Pump • Electric • 8.5 HSPF
Primary Cooling System: Air Source Heat Pump • Electric • 15 SEER
Primary Water Heating: Water Heater • Electric • 0.99 Energy Factor
House Tightness: 619 CFM50 (1.93 ACH50)
Ventilation: 42.0 CFM • 23.0 Watts
Duct Leakage to Outside: 0 CFM25
Above Grade Walls: R-25
Ceiling: Vaulted Roof, R-38
Window Type: U-Value: 0.27, SHGC: 0.19
Foundation Walls: N/A

This home meets or exceeds the criteria of the following:

Energy Star v3
Energy Star v3.1
2015 International Energy Conservation Code
2012 International Energy Conservation Code
2009 International Energy Conservation Code
2006 International Energy Conservation Code

Rating Completed by:

Energy Rater: LaTonya Davis
RESNET ID: 9292792

Rating Company: Fox Energy Specialists
3301 West Fwy, Fort Worth, TX 76107
817-546-0160

Rating Provider: Fox Energy Specialists
3301 West Fwy, Fort Worth, TX 76107
817-546-0160



LaTonya Davis
LaTonya Davis, Certified Energy Rater
Digitally signed: 12/26/18 at 12:27 PM

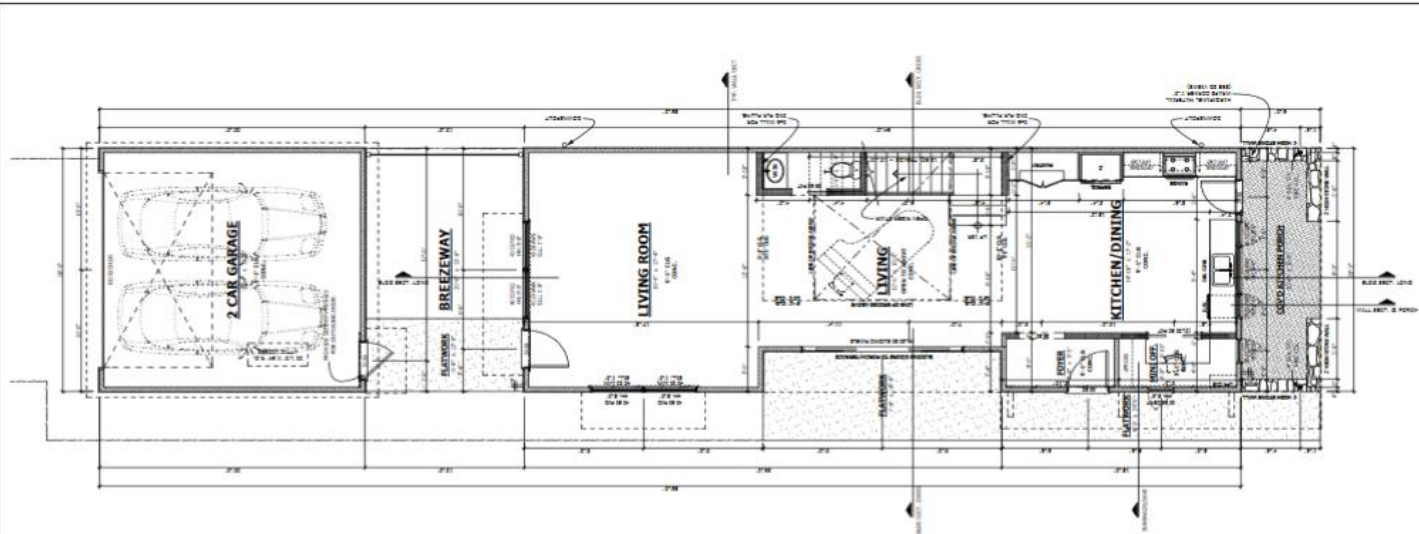
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Ekotrope RATER - Version 2.2.5.2069

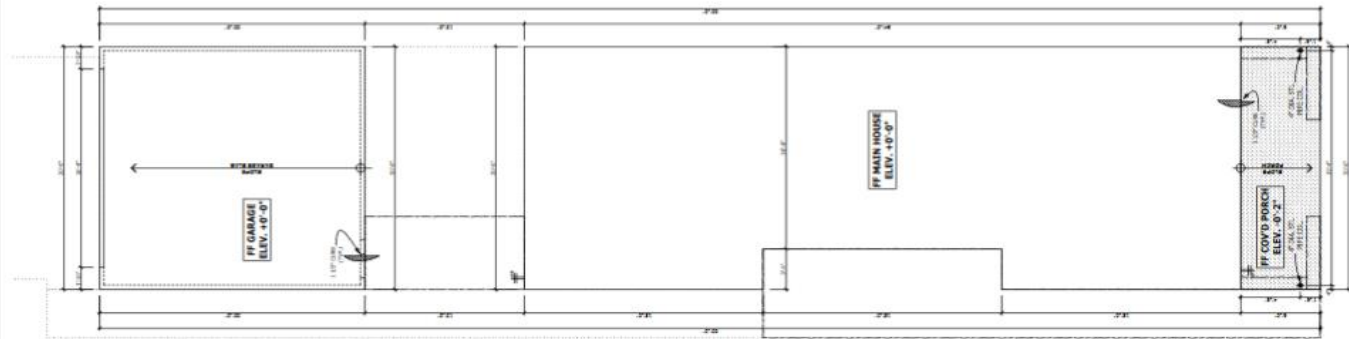
The Home Energy Rating Standard Disclosure for this house is available from the rating provider.
This report does not constitute any warranty or guarantee.

Floor Plan 1

3 Sisters Project Ft. Worth



01 1ST FLOOR PLAN
SCALE: 1/4" = 1'-0"



02 ARCH. FOUND PLAN
SCALE: 1/4" = 1'-0"

FLOOR AREAS		
NAME	STORY	AREA (sq ft)
HSE	1ST FLOOR	1,020
	2ND FLOOR	920
		1,940
GARAGE	1ST FLOOR	400
		400
PORCH (FRONT BALCONY)	2ND FLOOR	137
		137
PORCH (FRONT ENTRY)	1ST FLOOR	74
		74
PORCH (KITCHEN)	1ST FLOOR	120
		120
PORCH (SIDE)	1ST FLOOR	80
		80
		2,741

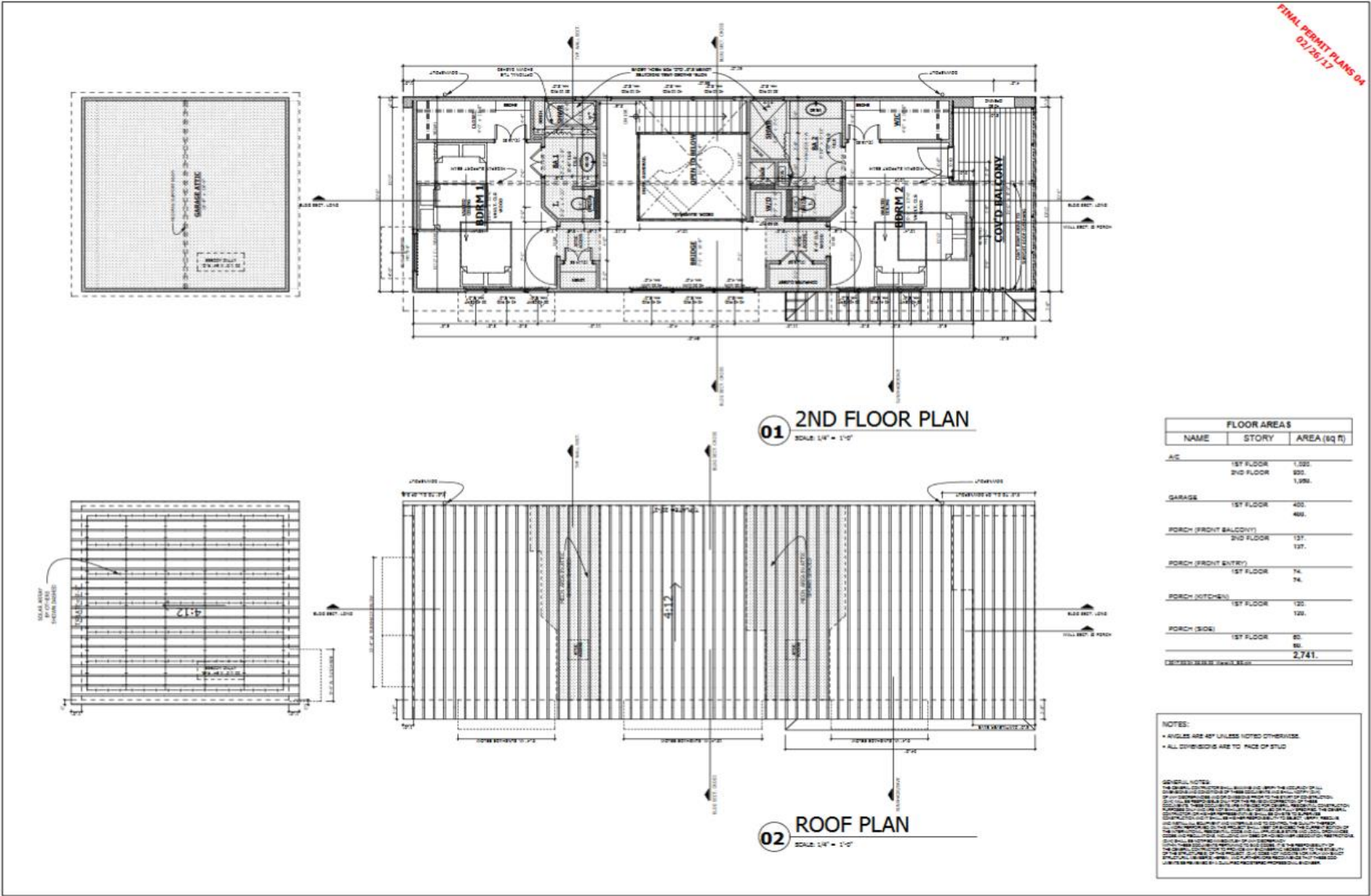
NOTES:
+ ANGLES ARE 45° UNLESS NOTED OTHERWISE
+ ALL DIMENSIONS ARE TO FACE OF STUD

GENERAL NOTES:
1. ALL DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE TO FACE OF STUD UNLESS NOTED OTHERWISE.
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FINAL PERMIT PLANS 04
02/26/17

Floor Plan 2

3 Sisters Project Ft. Worth



Building Summary

3 Sisters Project Ft. Worth



Building Summary

Property
5149 Byers Avenue
Fort Worth, TX 76107

Organization
Fox Energy Specialists
LaTonya Davis

Former Custom Homes_5149 Byers Avenue_Waire_c
Former Custom Homes_5149 Byers Avenue_Waire_c

Builder
Former Custom Homes

Inspection Status
2018_05-07
Rater ID (RTIN): 9292792
RESNET Registered (Confirmed)



General Building Information

Number Of Bedrooms	2
Number Of Floors	2
Conditioned Floor Area [sq. ft.]	1,940
Unconditioned, attached garage?	No
Conditioned Volume [cu. ft.]	19,248
Total Units in Building	1
Residence Type	Single family detached
Model	Ware Residence
Community	N/A
Climate Zone	3A

Basement Wall

None Present

Basement Wall Library List

None Present

Slab

Name	Library Type	Perimeter	Floor Grade	Carpet R	Exposed Masonry Area	Surface Area	Location	Enclosing
S.O.G.	Uninsulated	154.0	On Grade	1.23	0	1,020.0 sq. ft.	Exposed Exterior	Conditioned Space

Slab Library List

Name	Wall Construction Type	Slab Completely Insulated?	Underslab Insulation Width [ft]	Perimeter Insulation Depth [ft]	Perimeter Insulation R Value	R-value
Uninsulated	Wood Frame / Other	No	0	0	0	0.00

Framed Floor

Name	Library Type	Carpet R	Floor Grade	Surface Area	Location
Area Over Outside Air	R-43.0	1.23	Above Grade	55.0 sq. ft.	Exposed Exterior

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Former Custom Homes_5149 Byers Avenue_Waire_c
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Builder
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2018_05-07
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Framed Floor Library List

Name	R-value
R-43.0	35.194

Rim Joist

Name	Library Type	Surface Area	Location
RB Brick/Stucco	R 25.0	101.1 sq. ft.	Exposed Exterior
RB Siding Veneer	R 25.0	52.3 sq. ft.	Exposed Exterior

Rim Joist Library List

Name	R-value
R 25.0	25.00

Wall

Name	Library Type	Surface Color	Surface Area	Location
Brick/Stucco	SIP 25.0	Medium	2,152.9 sq. ft.	Exposed Exterior
Siding Veneer	SIP 25.0	Medium	910.1 sq. ft.	Exposed Exterior

Wall Library List

Name	R-value
SIP 25.0	25.008

Building Summary

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Building Summary

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LaTonya Davis



Builder
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2019.06.07
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Glazing

Name	Library Type	Wall Assignment	Basement Wall Assignment	Overhang Depth	Overhang Ft To Top	Overhang Ft To Bottom	Orientation	Surface Area
Back Brick/Stucco	0.27_0.19	Brick/Stucco		0	0	0	North	56.0 sq. ft.
Back Brick/Stucco	0.29_0.21	Brick/Stucco		0	0	0	North	24.0 sq. ft.
Front Brick/Stucco	0.27_0.22	Brick/Stucco		0	0	0	South	16.0 sq. ft.
Front Siding Veneer	0.27_0.19	Siding Veneer		0	0	0	South	50.0 sq. ft.
Glass Door	0.31_0.19	Brick/Stucco		0	0	0	North	24.0 sq. ft.
Glass Door	0.31_0.19	Brick/Stucco		0	0	0	South	24.0 sq. ft.
Glass Door	0.31_0.19	Brick/Stucco		4	1	9	East	128.0 sq. ft.
Glass Door Siding Veneer Front	0.31_0.19	Siding Veneer		0	0	0	South	21.6 sq. ft.
Glass Door Siding Veneer Left	0.31_0.19	Siding Veneer		4	1	9	East	24.0 sq. ft.
Left Brick/Stucco	0.27_0.19	Brick/Stucco		4	1	8	East	56.0 sq. ft.
Left Brick/Stucco	0.27_0.19	Brick/Stucco		4	1	8	East	136.0 sq. ft.
Left Siding Veneer	0.27_0.19	Siding Veneer		4	1	8	East	10.0 sq. ft.
Right Siding Veneer	0.27_0.19	Siding Veneer		0	0	0	West	16.0 sq. ft.

Glazing Library List

Name	Shgc	U-factor
0.27_0.19	0.19	0.270
0.27_0.22	0.22	0.270
0.29_0.21	0.21	0.290
0.31_0.19	0.19	0.310

Skylight

None Present

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Skylight Library List

None Present

Opaque Door

None Present

Opaque Door Library List

None Present

Roof Insulation

Name	Library Type	Attic Exterior Area (sq. ft.)	Clay or Concrete Roof Tiles	Surface Color	Surface Area	Location
Attic Slope	SIP	1,210.6	No	Light	1,210.6 sq. ft.	Vaulted Roof

Roof Insulation Library List

Name	Has Radiant Barrier	R-value
SIP	No	37.622

Whole House Infiltration

Infiltration	Measurement Type	Shelter Class
619 CPM at 50 Pa	(Blower-door tested)	4

Building Summary

3 Sisters Project Ft. Worth



Building Summary

Property
5148 Byers Avenue
Fort Worth, TX 76107

Organization
Fox Energy Specialists
LaTonya Davis

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Rater ID (RTIN): 5292792
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Mechanical Ventilation

Ventilation Type	Ventilation Rate [Cubic Feet /Minute]	Operational hours per day	Fan Watts	Runs once every three hours	Energy Recovery Percent
Supply Only	42	24	23	Yes	0

Lighting

% Interior Fluorescent Lighting	% Interior LED Lighting	% Exterior Fluorescent Lighting	% Exterior LED Lighting	% Garage Fluorescent Lighting	% Garage LED Lighting
100	0	0	0	0	0

Onsite Generation

None Present

Onsite Generation Library List

None Present

Solar Generation

Name	Library Type	\$/kWh from Utility
Solar Generation	Solar Generation	0

Solar Generation Library List

Name	Track Mode	Nameplate Capacity (kWdc)	Derate Factor	Orientation (deg)	Tilt (deg)
Solar Generation	Fixed	4.9 kW	0.95	180°	20°

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Conditioning Equipment

Name	Library Type	Heating Percent Load	Cooling Percent Load	Hot Water Percent Load
All-source heat pump (1)	36.0k 15.0SEER 8.5HSPF	100%	100%	0%
Water Heating (2)	0 gal. 0.99EF Electric	0%	0%	100%

Equipment Type: 0 gal. 0.99EF Electric

Fuel Type	Electric
Distribution Type	Hydronic Delivery
Hot Water Efficiency	0.99 Energy Factor
Tankless?	Yes

Equipment Type: 36.0k 15.0SEER 8.5HSPF

Fuel Type	Electric
Distribution Type	Forced Air
Motor Type	ECM (Variable Speed)
Heating Efficiency	8.5 HSPF
Heating Capacity [kBtu/h]	36
Cooling Efficiency	15 SEER
Cooling Capacity [kBtu/h]	36

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Ferrier Custom Homes_5149 Byers Avenue_Ware_1
Former Custom Homes_5149 Byers Avenue_Ware_1

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Distribution System

Distribution Type	Forced Air
Heating Equipment	Air-source heat pump (1)
Cooling Equipment	Air-source heat pump (1)
Sq. Feet Served	1940
# Return Grilles	1
Supply Duct R Value	6
Return Duct R Value	6
Supply Duct Area [sq. ft.]	523.8
Return Duct Area [sq. ft.]	97
Duct Leakage to Outdoors (CFM25)	0
Total Leakage (CFM25 @ 25Pa)	35
Total Leakage Duct Test Conditions	Rough in, with Air Handler
Use Default Flow Rate	Yes
Duct 1	
Duct Location	Conditioned Space
Percent Supply Area	100
Percent Return Area	100
Duct 2	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 3	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 4	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 5	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0
Duct 6	
Duct Location	Conditioned Space
Percent Supply Area	0
Percent Return Area	0

Ceiling Fan

Has Ceiling Fan	Yes
Cfm Per Watt	122

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Water Distribution

Water Fixture Type	Low-flow
Use Default Hot Water Pipe Length	No
Hot Water Pipe Length [ft]	20
At Least R3 Pipe Insulation?	Yes
Hot Water Recirculation System?	Yes
Hot Water Branch Length [ft]	10
Recirculation System Control	Manual Demand Control
Recirculation Pump Power [Watts]	50
Recirculation System Pipe Loop Length [ft]	20
Drain Water Heat Recovery?	No

Clothes Dryer

Fuel Type	Electric
Cef	2.617
Field Utilization	Timer Controls

Clothes Washer

Label Energy Rating	704 kWh/Year
Electric Rate	\$0.08/kWh
Annual Gas Cost	\$23.00
Gas Rate	\$0.55/Therm
Capacity	2.874
Imef	0.331

Appliances and Controls

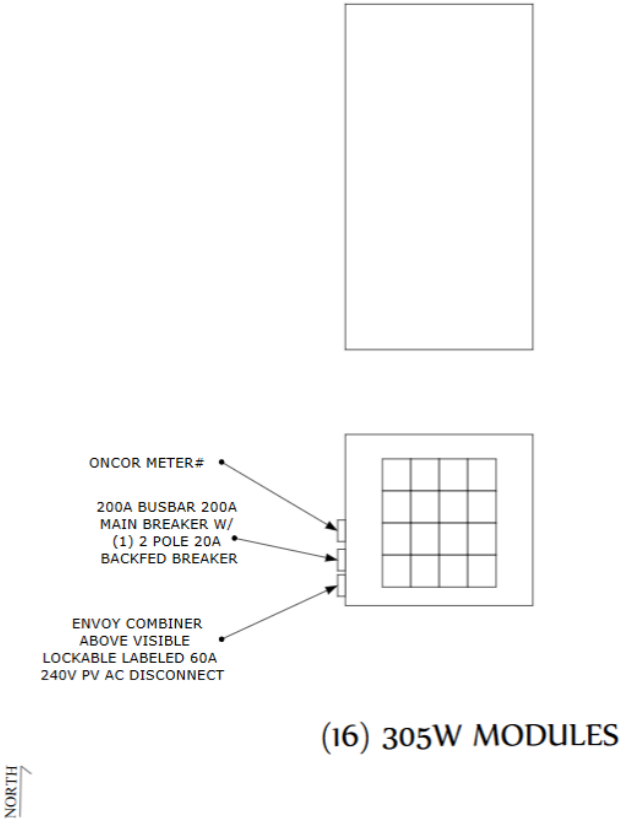
Programmable thermostat?	Yes
Dishwasher Size	Standard
Dishwasher Efficiency	285 kWh
Range/Oven Fuel	Electric
Convection Oven?	No
Induction Range?	No
Refrigerator Consumption	500 kWh/Year

Notes



4.88KW SOLAR ARRAY INSTALL AT WARE RESIDENCE

G.C. DON FERRIER: 1 (817) 475-8881



NATIVE

201 Cedar Street - Austin, TX 78701 - 512-815-NATIVE (512-8264)
www.nativeaustin.com TEL: 512.714.7444 FAX: 512.800-0470

PROJECT TITLE	
SHEET TITLE	
ARRAY PLAN, SITE MAP, MODULE DIMENSIONS, EQUIPMENT LAYOUT, HARDWARE SCHEDULE	E1.0
Drawn by: ETR	JAN 18, 2017 REV 1

Electrical Plan

3 Sisters Project Ft. Worth

