

Classic Competition



Grand Terrace Apartments



Grand Terrace Apartments

Participant information

Energy Panel Structures

Lee Bergum

603 N. Van Gordon Avenue

Graettinger, IA 51342

Phone: 612-499-0756

Email Address: lbergum@epsbuildings.com

Website: www.epsbuildings.com

Category: Multifamily

High Performance: No

Project information:

Grand Terrace Apartments

1585 Grand Avenue

Worthington, MN 56187

Date Completed: 10/2017

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

Total sq. ft. of conditioned space: 62,000 sqft

Built By (if different than applicant)

R.W. Carlstrom

Danny Umhoefer

1901 Excel Drive

Mankato, MN 56001

Panels Manufactured By: Energy Panel Structures

Designed By:

ISG

Joey Wendinger

603 North Van Gordon Avenue

Mankato, MN 56001

Total sq. ft. of conditioned space: 62,000 sqft

Describe the end use of the building: Rental Property for Affordable Housing



Grand Terrace Apartments



How did SIP construction help you get this job?

By utilizing SIPs into the structure, we were insured of energy and labor savings throughout the project build and after completion.

Describe the benefits of using SIPs on this project. Did SIPs help save time, labor, construction costs, or energy? This is an affordable housing project. Not only is rent a major part of making the units affordable, long term utility costs are very important to people on a fixed income.

Describe any innovative design elements or structural engineering involved:

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:

HERS Index (required only for High Performance Category and recommended for residential projects): 45

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

Energy use intensity in kBtu/ft² (required only for High Performance Category and recommended for commercial projects): .

Describe the HVAC system used on the project: Natural Gas Boiler, each apartment has a water to air heat pump with an air exchanger. U- .27

HERs report attached showing 45-48 rankings

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) Integrity from Marvin

Windows meet the 2009 IECC Requirements - Table 402.1.1.

Attic Insulation meets a R-50

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

Washers, Refrigerators, Dishwashers are all energy star

Commercial Gas Water Heater is energy star

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): All paint and caulk have low VOCs

Any additional comments on the project: Very quiet for tenants, very durable. All of this contributes to lower turnover.

Grand Terrace Apartments

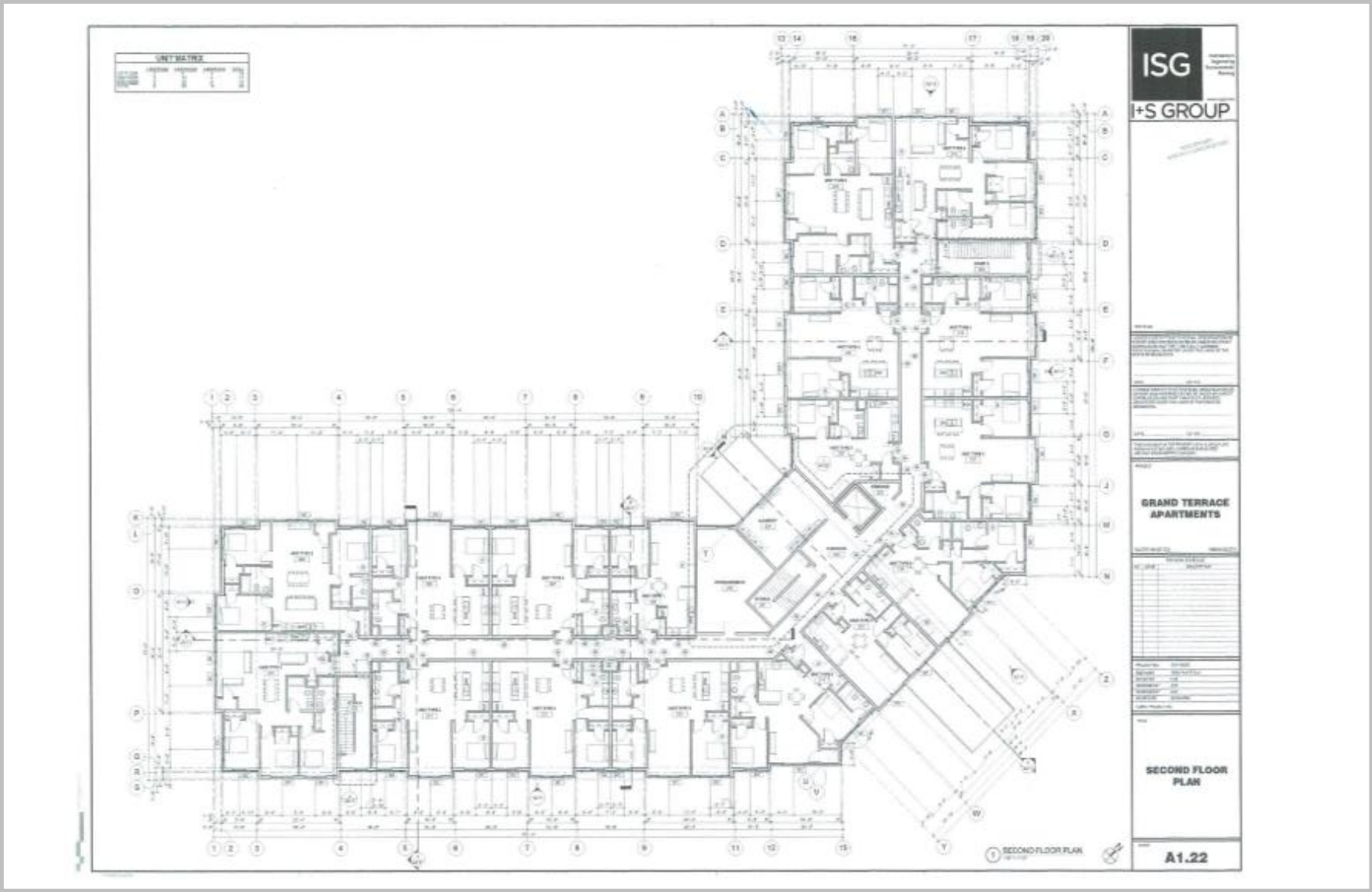




Grand Terrace Apartments



Grand Terrace Apartments



Energy Star Report by Unit Size

Grand Terrace Apartments



ENERGY STAR v3.1 Home Report

Property
1 Bedroom Unit
Worthington, MN

Weather: Rochester, MN
1 BR - Lower Level
1 BR_Lower
Level_28SEPTEMBER17.blg

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

Builder
SW MN Housing

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Projected Rating: Based on Plans - Field Confirmation Required.
Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	6.4	6.4
Cooling	3.7	2.8
Water Heating	10.0	1.0
Lights and Appliances	13.5	12.8
Total	33.5	23.0
HERS Index of Reference Design Home	72	48 HERS Index w/o PV
HERS Index Target (SAF Adjusted)	72	48 HERS Index
Size Adjustment Factor	1.00	

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home **MEETS** or **EXCEEDS** the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction
Carbon Dioxide (CO2) - tons/yr	3.0
Sulfur Dioxide (SO2) - lbs/yr	3.7
Nitrogen Oxides (NOx) - lbs/yr	7.4

Energy Cost Savings

	\$/yr
Heating	173
Cooling	33
Water Heating	113
Lights & Appliances	110
Total	429

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

REM/Rate - Residential Energy Analysis and Rating Software v15.3
This information does not constitute any warranty of energy cost or savings.
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ENERGY STAR v3.1 Home Report

Property
1 Bedroom Unit
Worthington, MN

Weather: Rochester, MN
1 BR - Mid Level
1 BR_Mid
Level_28SEPTEMBER17.blg

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

Builder
SW MN Housing

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Projected Rating: Based on Plans - Field Confirmation Required.
Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	4.2	4.3
Cooling	4.1	3.2
Water Heating	10.0	1.0
Lights and Appliances	13.5	12.8
Total	31.8	21.3
HERS Index of Reference Design Home	74	47 HERS Index w/o PV
HERS Index Target (SAF Adjusted)	74	47 HERS Index
Size Adjustment Factor	1.00	

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home **MEETS** or **EXCEEDS** the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction
Carbon Dioxide (CO2) - tons/yr	2.9
Sulfur Dioxide (SO2) - lbs/yr	3.8
Nitrogen Oxides (NOx) - lbs/yr	7.1

Energy Cost Savings

	\$/yr
Heating	154
Cooling	33
Water Heating	113
Lights & Appliances	110
Total	411

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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Energy Star Report by Unit Size

Grand Terrace Apartments



ENERGY STAR v3.1 Home Report

Property
1 Bedroom Unit
Worthington, MN

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Weather: Rochester, MN
1 BR - Top Level
1 BR_Top
Level_28SEPTEMBER17.blg

Builder
SW MN Housing

Projected Rating: Based on Plans - Field Confirmation Required.
Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed	
Heating	4.3	5.6	
Cooling	4.1	3.3	
Water Heating	10.0	1.0	
Lights and Appliances	13.5	12.8	
Total	31.8	22.7	
HERS Index of Reference Design Home	74	47	HERS Index w/o PV
HERS Index Target (SAF Adjusted)	74	47	HERS Index
Size Adjustment Factor	1.00		

ENERGY STAR v3.1 Mandatory Requirements

- ☒ Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
- ☒ Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
- ☒ Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
- ☒ Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
- ☒ Windows meet the 2009 IECC Requirements - Table 402.1.1.
- ☒ Duct insulation meets the EPA minimum requirements of R-6.
- ☒ Mechanical ventilation system is installed in the home.
- ☒ ENERGY STAR Checklists fully verified and complete.

This home **MEETS** or **EXCEEDS** the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction
Carbon Dioxide (CO2) - tons/yr	3.1
Sulfur Dioxide (SO2) - lbs/yr	3.8
Nitrogen Oxides (NOx) - lbs/yr	7.6

Energy Cost Savings

	\$/yr
Heating	180
Cooling	34
Water Heating	113
Lights & Appliances	110
Total	437

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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ENERGY STAR v3.1 Home Report

Property
2 Bedroom Unit
Worthington, MN

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Weather: Rochester, MN
2 BR - Lower Level
2 BR_Lower
Level_28SEPTEMBER17.blg

Builder
SW MN Housing

Projected Rating: Based on Plans - Field Confirmation Required.
Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed	
Heating	6.7	5.9	
Cooling	4.8	3.9	
Water Heating	13.6	1.6	
Lights and Appliances	16.1	15.0	
Total	41.1	26.4	
HERS Index of Reference Design Home	75	46	HERS Index w/o PV
HERS Index Target (SAF Adjusted)	75	46	HERS Index
Size Adjustment Factor	1.00		

ENERGY STAR v3.1 Mandatory Requirements

- ☒ Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
- ☒ Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
- ☒ Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
- ☒ Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
- ☒ Windows meet the 2009 IECC Requirements - Table 402.1.1.
- ☒ Duct insulation meets the EPA minimum requirements of R-6.
- ☒ Mechanical ventilation system is installed in the home.
- ☒ ENERGY STAR Checklists fully verified and complete.

This home **MEETS** or **EXCEEDS** the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction
Carbon Dioxide (CO2) - tons/yr	3.6
Sulfur Dioxide (SO2) - lbs/yr	4.6
Nitrogen Oxides (NOx) - lbs/yr	8.8

Energy Cost Savings

	\$/yr
Heating	207
Cooling	34
Water Heating	125
Lights & Appliances	143
Total	509

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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Energy Star Report by Unit Size

Grand Terrace Apartments



ENERGY STAR v3.1 Home Report

Property
2 Bedroom Unit
Worthington, MN

Weather: Rochester, MN
2 BR - Mid Level
2 BR_Mid
Level_28SEPTEMBER17.blg

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

Builder
SW MN Housing

HERS
ProjectedWorstCase
9/28/17
Rater ID: 9377462



Projected Rating: Based on Plans - Field Confirmation Required.

Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	5.2	4.4
Cooling	5.1	4.2
Water Heating	13.6	1.6
Lights and Appliances	16.1	15.0
Total	40.0	25.2
HERS Index of Reference Design Home	76	46 HERS Index w/o PV
HERS Index Target (SAF Adjusted)	76	46 HERS Index
Size Adjustment Factor	1.00	

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction	Energy Cost Savings	\$/yr
Carbon Dioxide (CO2) - tons/yr	3.5	Heating	195
Sulfur Dioxide (SO2) - lbs/yr	4.6	Cooling	35
Nitrogen Oxides (NOx) - lbs/yr	6.7	Water Heating	125
		Lights & Appliances	143
		Total	498

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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ENERGY STAR v3.1 Home Report

Property
2 Bedroom Unit
Worthington, MN

Weather: Rochester, MN
2 BR - Top Level
2 BR_Top
Level_28SEPTEMBER17.blg

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

Builder
SW MN Housing

HERS
ProjectedWorstCase
9/28/17
Rater ID: 9377462



Projected Rating: Based on Plans - Field Confirmation Required.

Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	5.3	6.1
Cooling	5.0	4.3
Water Heating	13.6	1.6
Lights and Appliances	16.1	15.0
Total	40.0	27.0
HERS Index of Reference Design Home	76	45 HERS Index w/o PV
HERS Index Target (SAF Adjusted)	76	45 HERS Index
Size Adjustment Factor	1.00	

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3/3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3/3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction	Energy Cost Savings	\$/yr
Carbon Dioxide (CO2) - tons/yr	3.8	Heating	233
Sulfur Dioxide (SO2) - lbs/yr	4.6	Cooling	35
Nitrogen Oxides (NOx) - lbs/yr	9.3	Water Heating	125
		Lights & Appliances	143
		Total	535

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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ENERGY STAR v3.1 Home Report

Property
3 Bedroom Unit
Worthington, MN

Organization
Building Knowledge, Inc.
952-944-5605
Pat O'Malley

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Weather: Rochester, MN
3 BR - Lower Level
3 BR_Lower
Level_28SEPTEMBER17.blg

Builder
SW MN Housing

Projected Rating: Based on Plans - Field Confirmation Required.

Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	12.7	11.5
Cooling	6.6	4.8
Water Heating	17.0	2.1
Lights and Appliances	18.6	17.1
Total	55.0	35.6

HERS Index of Reference Design Home	76	47	HERS Index w/o PV
HERS Index Target (SAF Adjusted)	76	47	HERS Index
Size Adjustment Factor	1.00		

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction	Energy Cost Savings	\$/yr
Carbon Dioxide (CO2) - tons/yr	4.5	Heating	286
Sulfur Dioxide (SO2) - lbs/yr	5.4	Cooling	39
Nitrogen Oxides (NOx) - lbs/yr	11.0	Water Heating	136
		Lights & Appliances	175
		Total	636

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ENERGY STAR v3.1 Home Report

Property
3 Bedroom Unit
Worthington, MN

Organization
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952-944-5605
Pat O'Malley

HERS
Projected/WorstCase
9/28/17
Rater ID: 9377462



Weather: Rochester, MN
3 BR - Mid Level
3 BR_Mid
Level_28SEPTEMBER17.blg

Builder
SW MN Housing

Projected Rating: Based on Plans - Field Confirmation Required.

Normalized, Modified End-Use Loads (MMBtu/yr)

	ENERGY STAR	As Designed
Heating	9.7	7.8
Cooling	7.3	6.4
Water Heating	17.0	2.1
Lights and Appliances	18.6	17.1
Total	52.6	33.5

HERS Index of Reference Design Home	77	47	HERS Index w/o PV
HERS Index Target (SAF Adjusted)	77	47	HERS Index
Size Adjustment Factor	1.00		

ENERGY STAR v3.1 Mandatory Requirements

X	Duct leakage at post construction better than or equal to ENERGY STAR v3.1 requirements.
X	Envelope insulation levels meet or exceed ENERGY STAR v3.1 requirements.
X	Slab on Grade Insulation must be > R-5, and at IECC 2009 Depth for Climate Zones 4 and above.
X	Envelope insulation achieves RESNET Grade I installation, or Grade II with insulated sheathing.
X	Windows meet the 2009 IECC Requirements - Table 402.1.1.
X	Duct insulation meets the EPA minimum requirements of R-6.
X	Mechanical ventilation system is installed in the home.
X	ENERGY STAR Checklists fully verified and complete.

This home MEETS or EXCEEDS the energy efficiency requirements for designation as an EPA ENERGY STAR Version 3.1 Qualified Home.
HERS Index w/o PV <= HERS Index of Reference Design Home AND HERS Index <= HERS Index Target to comply.

Pollution Prevented

Type of Emissions	Reduction	Energy Cost Savings	\$/yr
Carbon Dioxide (CO2) - tons/yr	4.3	Heating	272
Sulfur Dioxide (SO2) - lbs/yr	5.2	Cooling	32
Nitrogen Oxides (NOx) - lbs/yr	10.7	Water Heating	136
		Lights & Appliances	175
		Total	614

The energy cost savings and pollution prevented are calculated by comparing the Rated Home to the Reference Home as defined in the Mortgage Industry National Home Energy Rating Systems Standards as promulgated by the Residential Energy Services Network (RESNET). In accordance with these guidelines, building inputs affecting setpoints, infiltration rates, window shading and the existence of mechanical systems may have been changed prior to calculating loads.

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