

## GreenStar Homes Online Workbook & Manual Users Guide.

This guide is a short tutorial using pictures and words to help guide you to easily use the GreenStar program to make your next project healthier, more energy efficient and better.

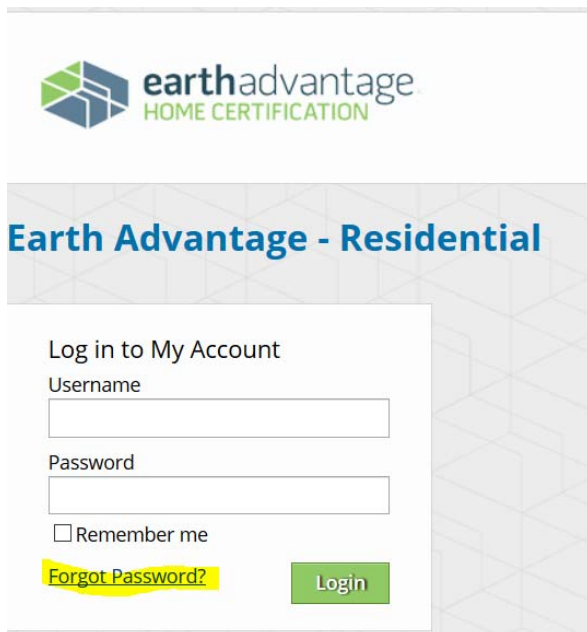
The workbook is always listed online because it is constantly updated and improved based on green building science as well as becoming more easy to use with every update.

Checklist access <http://50.112.244.1/projects/>

Username: When the checklist is setup it is Firstnamelastinitial unless you change it

Password: greenstar1 (we recommend changing it)

If you forget your password – Click forgot password. If you forget your username email [info@greenhomeinstitute.org](mailto:info@greenhomeinstitute.org)



Upon logging in you will see all of your projects or none listed on your first login bundled up in one area as show below.

You can click the forms button to get the full manual or click new project to get into the meat & bones of the program or workbook. We recommend starting with new project as opposed to downloading the manual as the manual is not meant to be read straight through.

Measures overview gives you a summary of every credit while the Measures guide (the manual) gives all the details. If you download this please note that if and when the program updates it will be out of date. Program updates will come with a months notice and you be able to vote on changes in the future.

- PROJECTS
- PROJECT GREEN LEADERS
- REPORTS
- FORMS
- POINTS WORKSHEET

\*Admins Only see this  
[Log a software Issue](#)

## GreenStar

- [Measures Overview](#)
- [Measures Guide](#)
- [Prerequisites](#)

Click New project

My Profile | Logout

Thanks to our checklist sponsors  
**Andersen**

### Manage Projects

[New Project](#)

Keywords:  GBC:  Status:  Active:

101 to 105 of 105 => prev 2 3 4 5 6

Project Status	Status Date	Address	Project Green Leader	
Created	06/23/2014	Subdivision: JoneeVille - Lot: AnyLott - Jonee Street, Jonee City, MN 55106		<a href="#">View</a> <a href="#">Delete</a>
Created	06/23/2014	Subdivision: CusackVille - Lot: anylott - anystreet, anycity, MN 55106		<a href="#">View</a> <a href="#">Delete</a>
Created	06/03/2014	4339 SE 87th Ave, Portland, OR 97266	Earth Advantage - Michael Atkins	<a href="#">View</a> <a href="#">Delete</a>
Created	05/22/2014	4339 SE 87th Ave, Portland, OR 97266	Earth Advantage - Michael Atkins	<a href="#">View</a> <a href="#">Delete</a>
Created	05/16/2014	123 Main street, Warren, OR 97053		<a href="#">View</a> <a href="#">Delete</a>

You will see space to enter in project details here. Just enter in anything if you are just piloting the program.



- PROJECTS**
- PROJECT GREEN LEADERS
- REPORTS
- FORMS
- POINTS WORKSHEET

[Browse Projects](#) \ [View Project](#) \ [Edit Project](#)

## Edit Project

### Program/Builder

(required to start a new project)

Program GreenStar

Project Green Leader

Green Building Consultant

### Site

(required to start a new project)

Enter the subdivision / lot number and address if available. If both are not available, enter either the subdivision / lot number or the address.

Subdivision  [Add a new subdivision](#)

Lot Number

**and/or**

Address

Address 2

City

State

Zip Code

Select project green leader as yourself

Select Green Building consultant as Little, Brett until further notice.

You can skip sub division and fill the rest out as you see fit.

**Project Status: Created**

Address: 920 Cherry St Se, Grand Rapids, MI 49516

Subdivision:

Lot: test 1

Project Green Leader: Green Home Institute, Brett Little

Green Building Consultant: Brett Little

[Complete Project Details](#)

Points:					Total	Level
Min Required:	266	109	110	162	58	60
Proposed:	0	0	0	0	0	0
Yes:	78	59	60	97	41	335 None
Verified:	0	0	0	0	0	0 None
Eligible Pillars:						

[Selected Measures Overview](#)  
[Selected Measures Guide](#)

[Edit](#)

**Project Documents**

**Download Accountability Forms**

- Building Architect / Designer Accountability Form
- Cabinetry & Millwork Accountability Form
- Electrical Contractor Accountability Form
- Framing Contractor Accountability Form
- General Contractor Accountability Form
- GreenStar Administration Accountability Form
- Homeowner Accountability Form
- HVAC Accountability Form
- Insulation Contractor Accountability Form
- Interior Designer Accountability Form
- Landscape Accountability Form
- Masonry Contractor Accountability Form
- Painting / Finishing Contractor Accountability Form
- Plumbing Contractor Accountability Form
- Rater Accountability Form
- Roofing Contractor Accountability Form
- Solar Contractor Accountability Form

**Inspections**

Inspections are not available until the worksheet has been reviewed

Now you will be brought to this screen.

If you need change the details at any time just click complete project details with the red arrow.

Now click on edit and get into the workbook.

# Points Worksheet

Lot: test 1 - 920 Cherry St Se, Grand Rapids, MI 49516

Save and Return to Overview | Submit for Approval

Points:	⚡	🌿	🌍	🏠	💧	Total	Level
Min Required:	266	109	110	162	58	60	
Proposed:	0	0	0	0	0	0	
Yes:	78	59	60	97	41	335	None
Verified:	0	0	0	0	0	0	None
Eligible Pillars:	⊗	⊗	⊗	⊗	⊗		
+ Maximize All				- Minimize All			

## Filter Measures By:

Worksheet Status:  None Selected  Yes  Proposed  No  N/A

Has points in  
 Energy  Health  Land  Materials  Water

Show Prerequisite  Hide Prerequisite

Clear

Click the top or bottom of sections to expand or collapse them

### 1. Overall Requirements

### 2. Preconstruction Design Strategies

### 3. Site & Landscape

### 4. Improve Existing Floor, Wall, and Roof

### 5. New Floor, Wall, and Roof

### 6. Mechanical

You will see several things going on here. The first place to start is overall requirements and make sure your project will meet these. Simply click on the tab to expand it.

Click the top or bottom of sections to expand or collapse them

**1. Overall Requirements**

1.1 Prerequisites

Yes/Proposed/No								
G	● ● ●	?	1.1.1 Project Type & Certification Level Start here first	New Construction - Gold				
G	● ● ●	N/A	1.1.2 Register project with GreenHome Institute		✓	✓	✓	✓
G	● ● ●	N/A	1.1.3 Qualified project team leader Become qualified or work with someone who is		✓	✓	✓	✓
G	● ● ●	N/A	1.1.4 Obtain all required permits & follow all required local and state bldg codes		✓	✓	✓	✓
G	● ● ●	N/A	1.1.5 Create or submit a waste management plan Waste slips are also accepted instead		✓	✓	✓	✓
R	● ● ●	N/A	1.1.6 Pass Fresh Air Supply (FAS) and Worst Case Combustion Spillage (WCCS) tests at end of the project. Include any fireplace in WCCS		✓	✓	✓	✓
G	● ● ●	N/A	1.1.7 Minimum of one carbon monoxide alarm installed within ten (10) feet of each bedroom.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.8 Perform radon test in lowest possible habitable space. Mitigate if necessary. Remodel only   Not required on homes with a system		✓	✓	✓	✓
G	● ● ●	N/A	1.1.9 Use Integrated Pest Management (IPM) methods to minimize pest entry.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.10 No intentional use of imported Forest Products on the "Controlled Imports List" unless FSC Certified. All Products from Canada are allowed without FSC Certification.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.11 All new connecting doors between living space and attached garage must be gasketed or made substantially air-tight with weather stripping and an automatic closer		✓	✓	✓	✓
G	● ● ●	N/A	1.1.12 Any new installation of salvaged doors or windows in an exterior application must be weather stripped, or air sealed with appropriate gasket.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.13 New structural plywood & OSB must conform to PS1 and PS2 standards.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.14 No mercury thermostats (remove/replace if pre-existing, dispose of properly)		✓	✓	✓	✓
G	● ● ●	N/A	1.1.15 No power roof vents unless adequate air inlets exist.		✓	✓	✓	✓
I	● ● ●	N/A	1.1.16 All insulation used must be formaldehyde free		✓	✓	✓	✓
G	● ● ●	N/A	1.1.19 Seal all ducts and air handlers to prevent contamination during construction Cleaning ducts is acceptable as well.		✓	✓	✓	✓
G	● ● ●	N/A	1.1.21 No construction debris shall be discarded and closed inside any wall assembly		✓	✓	✓	✓
H	● ● ●	N/A	1.1.22 Educate the homeowner about how to "operate" their home		✓	✓	✓	✓
H	● ● ●	N/A	1.1.23 Provide homeowner with a user's manual covering house maintenance and green features of home.		✓	✓	✓	✓

Points:	⚡	🌿	🌍	🏠	💧	Total	Level
Min Required:	266	109	110	162	58	60	
Proposed:	0	0	0	0	0	0	
Yes:	78	59	60	97	41	335	None
Verified:	0	0	0	0	0	0	None
Eligible Pillars:	⊗	⊗	⊗	⊗	⊗		
+ Maximize All				- Minimize All			

Start with credit 1.1.1 if you know what your project will be. Click on the blue question mark to learn more about the best choice for your project.

# 1. Overall Requirements

## 1.1 Prerequisites

Yes/Proposed/No	
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/>	<b>1.1.1 Project Type &amp; Certification Level</b> Start here first
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.2 Register project with GreenHome Institute</b>
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.3 Qualified project team leader</b> Become qualified or work with someone who is
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.4 Obtain all required permits &amp; follow all required local and state bldg codes</b>
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.5 Create or submit a waste management plan</b> Waste slips are also accepted instead
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.6 Pass Fresh Air Supply (FAS) and Worst Case Combustion Spillage (WCCS) tests at end of the project.</b> Include WCCS
<input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> N/A	<b>1.1.7 Minimum of one carbon monoxide alarm installed within ten (10) feet of each bedroom.</b>

Notice all of the credit details pop up! That is it. There are no more referenced or details about each credit other than what is listed in those blue ? boxes. You won't have to look elsewhere.

### Measure Details

#### Project Type & Certification Level

Start here first

The higher the certification goal the less points received. The Min required is where you need to hit with all total points. Your certification level is what is selected here and can be changed later if you have more or less than desired points.

Remodel - Renovations that do not add conditioned space.

Add Conditioned Space to Interior - Renovations that add conditioned space without changing the exterior shell of the building.

Add Conditioned Space to Exterior - Renovations that add conditioned space by changing the exterior shell of the building but DO NOT add new foundation and/or footings for that added space.

Addition - Renovations that add conditioned space by changing the exterior shell of the building and add new foundation and/or footings for that added conditioned space.

New Construction - Also you can use this for Gut Rehabs if a majority of the structure is being changed such as ducts, HVAC walls and etc.

#### Benefit

Get rewarded for doing less. There are more points for renovating an existing home but new homes get points as well.

#### Verification

Accountability form signed.

Rater to document before and after.

Close

Let's go through each area of the credit details



## Measure Details



### Project Type & Certification Level

Start here first

The higher the certification goal the less points received. This is where you need to hit with all total points. Your certification level is selected here and can be changed later if you have more credit points.

These are where all credit details include resource links, exceptions, and alternatives to meeting the credit.

Remodel - Renovations that do not add conditioned space.

Add Conditioned Space to Interior - Renovations that add conditioned space without changing the exterior shell of the building.

Add Conditioned Space to Exterior - Renovations that add conditioned space by changing the exterior shell of the building but DO NOT add new foundation and/or footings for that added space.

Addition - Renovations that add conditioned space by changing the exterior shell of the building and add new foundation and/or footings for that added conditioned space.

New Construction - You can use this for Gut Rehabs if a majority of the structure is new such as ducts, HVAC walls and etc.

Why this is important.

### Benefit

Get rewarded for doing less. There are more points for renovating an existing home but new homes get points as well.

### Verification

What we need to verify this credit

Accountability form signed.

Rater to document before and after.

Close

Now – determine which is best for your project or skip if you do not know yet. Simply select Yes and this will turn the box green indicated you are going for this credit and then select the appropriate project type.

**Filter Measures By:**

Worksheet Status:  None Selected  Yes  Proposed  No  N/A

Has points in

Energy  Health  Land  Materials  Water

Show Prerequisite  Hide Prerequisite

Clear

Points:						Total	Level
Min Required:	266	109	110	162	58	60	
Proposed:	0	0	0	0	0	0	
Yes:	144	79	86	119	51	479	None
Verified:	0	0	0	0	0	0	None
Eligible Pillars:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
+ Maximize All		- Minimize All					

▼ Click the top or bottom of sections to expand or collapse them ▼

### 1. Overall Requirements

#### 1.1 Prerequisites

Yes/Proposed/No	Points:						Notes
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.1 Project Type & Certification Level Start here first	144	79	82	119	40		
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.2 Register project with GreenHome Institute							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.3 Qualified project team leader Become qualified or work with someone who is							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.4 Obtain all required permits & follow all required local and state bldg codes							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.5 Create or submit a waste management plan Waste slips are also accepted Instead							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.6 Pass Fresh Air Supply (FAS) and Worst Case Combustion Spillage (WCCS) tests at end of the project. Include any fireplace in WCCS							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.7 Minimum of one carbon monoxide alarm installed within ten (10) feet of each bedroom.							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.8 Perform radon test in lowest possible habitable space. Mitigate if necessary. Remodel only   Not required on homes with a system							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.9 Use Integrated Pest Management (IPM) methods to minimize pest entry.							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.10 No intentional use of Imported Forest Products on the "Controlled Imports List" unless FSC Certified. All Products from Canada are allowed without FSC Certification.							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.11 All new connecting doors between living space and attached garage must be gasketed or made substantially air-tight with weather stripping and an automatic closer							
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 1.1.12 Any new installation of salvaged doors or windows in an exterior application must be weather stripped, or air sealed with appropriate gasket.							

Notice you are rewarded more points for doing less. More points for only doing remodel vs addition or a new home and so it is easier or harder to get to the total. Also, less points are awarded if you go for silver or gold because there is a wider gap you need to achieve by getting all the points. You must score enough points in each of the 5 pillars of green to certify. If you score in some you can “medal” in those categories.

Points:						Total	Level
Min Required:	266	109	110	162	58	60	
Proposed:	0	0	0	0	0	0	
Yes:	144	79	86	119	51	479	None
Verified:	0	0	0	0	0	0	None
Eligible Pillars:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
+ Maximize All		- Minimize All					

Gap to certify

Now go through section 1 and read all of the prerequisites to make sure you can meet them or understand them. This is also a great time to start using the notes section. All prerequisites will have check marks instead of points.

1. Overall Requirements		Yes:	144	79	86	119	51	479	None
1.1 Prerequisites		Verified:	0	0	0	0	0	0	None
Yes/Proposed/No		Eligible Pillars:	⊗	⊗	⊗	⊗	⊗	⊗	
		Points:	+ Maximize All		- Minimize All				
<input checked="" type="checkbox"/>	1.1.1 Project Type & Certification Level Start here first	Remodel - Gold	144	79	82	119	40		
<input checked="" type="checkbox"/>	N/A 1.1.2 Register project with GreenHome Institute		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.3 Qualified project team leader Become qualified or work with someone who is		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.4 Obtain all required permits & follow all required local and state bldg codes		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.5 Create or submit a waste management plan Waste slips are also accepted instead		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.6 Pass Fresh Air Supply (FAS) and Worst Case Combustion Spillage (WCCS) tests at end of the project. Include any fireplace in WCCS		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.7 Minimum of one carbon monoxide alarm installed within ten (10) feet of each bedroom.		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.8 Perform radon test in lowest possible habitable space. Mitigate if necessary. Remodel only   Not required on homes with a system		✓	✓	✓	✓	✓		
<input checked="" type="checkbox"/>	N/A 1.1.9 Use Integrated Pest Management (IPM) methods to minimize pest entry.		✓	✓	✓	✓	✓		

Notes are a great place to leave notes to yourself, the rater or others on the team as well as the reviewer. Here you can also place links to shared files relevant to the credit on box.com, dropbox, google drive or other cloud based software. Use the note section also note prerequisites you can't meet for your project and make sure to select N/A as well such as the example below.

▼ Click the top or bottom of sections to expand or collapse them ▼

### Extended Notes

This home has a radon system and will not need to test - Initials

1. Overall Requirements

1.1 Prerequisites

Yes/Proposed/No

1.1.1 Project Type & Certification Level Start here first

N/A 1.1.2 Register project with GreenHome Institute

N/A 1.1.3 Qualified project team leader Become qualified or

N/A 1.1.4 Obtain all required permits & follow all required

N/A 1.1.5 Create or submit a waste management plan Was

N/A 1.1.6 Pass Fresh Air Supply (FAS) and Worst Case Combustion Spillage (WCCS) tests at end of the project. Include any fireplace in WCCS

N/A 1.1.7 Minimum of one carbon monoxide alarm installed within ten (10) feet of each bedroom.

N/A 1.1.8 Perform radon test in lowest possible habitable space. Mitigate if necessary. Remodel only | Not required on homes with a system

N/A 1.1.9 Use Integrated Pest Management (IPM) methods to minimize pest entry.

N/A 1.1.10 No intentional use of imported Forest Products on the "Controlled Imports List" unless FSC Certified. All Products from Canada are allowed without FSC Certification.

N/A 1.1.11 All new connecting doors between living space and attached garage must be gasketed or made substantially air-tight with weather stripping and an automatic closer

N/A 1.1.12 Any new installation of salvaged doors or windows in an exterior application must be weather stripped, or air sealed with appropriate gasket.

If you are working on an existing home there may be sections you do not need or you may want to skip some sections if they are not a part of your project.



1. Overall Requirements
2. Preconstruction Design Strategies
3. Site & Landscape
4. Improve Existing Floor, Wall, and Roof
5. New Floor, Wall, and Roof
6. Mechanical
7. Electrical
8. Water - Plumbing, Systems & Fixtures
9. Finish Materials & Coatings
10. Waste Management
11. Education
12. Innovation

This section is required in new but not in project that will not impact the landscape.

Section 4 is needed for remodels, 5 for new homes and both may be needed on additions

Not changing the HVAC on a remodel? Skip this

As you go through the workbook select the proposed credits on the ones you may do and see they will turn yellow as well as add up in the box.

2. Preconstruction Design Strategies							Eligible Pillars:
2.1 Integrated & Trained Project Team							+ M
Yes/Proposed/No							Points:
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4 to 7 Qualified
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
							Points:
							Total Level
Min Required:							266 109 110 162 58 60
Proposed:							4 4 2 2 2 14
Yes:							149 84 91 124 56 504 None
Verified:							0 0 0 0 0 0 None
Eligible Pillars:							✘ ✘ ✘ ✘ ✘
+ Maximize All							- Minimize All

**You do not have to select no credits are you are not achieving!** It is mainly there to select no prereqs you do not need.

Once you fill out all the credits now click on save and return. Here you can download a special customized measures overview and guide with credits only relevant do your project.

**Project Status: Created**

Address: **920 Cherry St Se  
Grand Rapids, MI 49516**

Subdivision:

Lot: **test 1**

[Complete Project Details](#)

---

**Points Worksheet** NH1\_3

Points:						Total	Level	
Min Required:	266	109	110	162	58	<b>60</b>		
Proposed:	4	4	2	2	2	<b>14</b>		
Yes:	149	84	91	124	56	<b>504</b>	None	
Verified:	0	0	0	0	0	<b>0</b>	None	
Eligible Pillars:								

[Selected Measures Overview](#)

[Selected Measures Guide](#)

[Edit](#)

After you download those, go ahead and look at the accountability forms on the right side of the page.

## Project Documents

### Download Accountability Forms

- [Building Architect / Designer Accountability Form](#)
- [Cabinetry & Millwork Accountability Form](#)
- [Electrical Contractor Accountability Form](#)
- [Framing Contractor Accountability Form](#)
- [General Contractor Accountability Form](#)
- [GreenStar Administration Accountability Form](#)
- [Homeowner Accountability Form](#)
- [HVAC Accountability Form](#)
- [Insulation Contractor Accountability Form](#)
- [Interior Designer Accountability Form](#)
- [Landscape Accountability Form](#)
- [Masonry Contractor Accountability Form](#)
- [Painting / Finishing Contractor Accountability Form](#)
- [Plumbing Contractor Accountability Form](#)
- [Rater Accountability Form](#)
- [Roofing Contractor Accountability Form](#)
- [Solar Contractor Accountability Form](#)
- [Tile Contractor Accountability Form](#)

These forms are predetermined by the checklist and in the future you can change them. They populate the credits responsible for that trade. You will see the first letter next to each credit.

Yes/Proposed/No	
<input type="radio"/>	2.1.1 Trained Project Team. L
<input type="radio"/>	2.1.2 Create multi-disciplin meetings.
H <input type="radio"/>	2.1.4 Hire a credentialed HV
<input type="radio"/>	2.1.6 GreenHome Designate
G <input type="radio"/>	2.1.7 Complete preconstruct
2.2 Design	
Yes/Proposed/No	
R <input type="radio"/>	2.2.1 Energy Model + Post Co
B <input type="radio"/>	2.2.2 Water performance mo
<input type="radio"/>	2.2.2 Home Size after constru
<input type="radio"/>	2.2.3 Document all existing c
<input type="radio"/>	2.2.4 Contract with a GreenS
<input type="radio"/>	2.2.5 Estimate carbon emissi
G <input type="radio"/>	2.2.6 Accessibility & Univers

If you don't want that task assigned to that trade that is fine but you need to change it by hand. You will need to download the PDF, convert to a word doc and remove the credits and add them elsewhere.

These accountability forms can be used for bids, specifications and scopes of work and contract language. See below in the addendum to see how that would work for an HVAC bid as an example.

When you are ready to certify please select the submit for approval button. You should not do this until you rater gives you the go ahead.

**Points Worksheet**

Lot: test 1 - 920 Cherry St Se, Grand Rapids, MI 49516

Save and Return to Overview **Submit for Approval** Autosaved at 6:46:14 PM

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# HVAC Accountability Form

Address: Lot: test 1 - 920 Cherry St Se, Grand Rapids, MI 49516

Project

Green

Leader: Brett Little at Green Home Institute

All declarations and affirmations made in this accountability form are made to GreenHome Institute (GHI) solely for the purpose of assisting GHI in determining whether GreenStar Home Certification is merited. No such declaration or affirmation can be construed as a warranty or guarantee of the performance of the building.

**Instructions:** This form is to be completed by the person / organization responsible for the design and/or implementation of one or more of the GreenStar Homes measures below. A separate form shall be completed by each professional responsible for one or more measures.

**Step 1.** Review the requirements of the measure(s) for which you are responsible in the GreenStar Resource Guide.

**Step 2.** In the Areas of Accountability section, initial boxes to indicate the GreenStar Homes measure(s) for which you have the primary design/implementation responsibility.

**Step 3.** Complete the Official Certification section at the bottom of the form.

**Step 4.** Maintain a project documentation file on Box.com or elsewhere to assist in the event of an audit of your measure(s) in this project.



## 6. Mechanical

<b>6.1 PREREQUISITES</b>	<b>Initial Below</b>
6.1.0 All flex duct pulled tight-no pinches	<u>SJ</u>
6.1.0 No new unvented combustion units, with the exception of kitchen-type cooking devices with exhaust ventilation	<u>SJ</u>
6.1.2 No equipment is permitted that intentionally produces ozone as a product rather than as an incidental by-product	<u>SJ</u>
6.1.2 All new ductwork in unconditioned space insulated. (attics = R-30 min.) (walls = R10 min.)	<u>SJ</u>
6.1.3 No air handlers or conditioning equipment shall be placed in unconditioned spaces (e.g., garage) (condensers located outside is o.k.)	<u>SJ</u>
6.1.3 No building cavities can be used as ductwork. (i.e. no panning of joist or wall cavities for duct supply or return)	<u>SJ</u>
6.1.5 All new ductwork must be sealed	<u>\$500.00</u>
6.1.6 New ducting MAY NOT use building cavities as part of air supply or return system.	<u>SJ</u>
6.1.7 All New bath fan ducting that is in unheated space shall be insulated to min R8	<u>SJ</u>
6.1.8 All new cooling and heating equipment must be installed with a programmable thermostat --AND-- it must be programmed	<u>\$300.00</u>
6.1.9 No new air handling equipment shall be installed in a garage. If existing, it must be in a room sealed off from automobile emissions, and with fresh air supply as required by mechanical equipment within.	<u>SJ</u>
<b>6.2 VENTILATION AND FRESH AIR FOR OCCUPANTS</b>	<b>Initial Below</b>
6.2.0 Design and install a whole house fresh air ventilation system.	<u>SJ</u>
6.2.2 Specify proper ventilation of the bathroom(s).	<u>\$1300.00</u>
6.2.3 Properly Ventilate the Kitchen	<u>\$500.00</u>
6.2.9 Heat or energy recovery ventilator installed	<u>\$2,000.00</u>

By affixing my signature below, the undersigned does hereby declare and affirm that the GreenStar Home Measures, as specified are met and will, if audited, produce the necessary supporting documents (drawings, calculations, etc.).

Responsible Party

Date

7/15/16

Printed Name

Sara Jones

Project Role / Title

HVAC Contractor

Organization / Company

High Performance HVAC

Signature

*Sara Jones*



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## 6.1.0 - Yes

Accountability Form: **HVAC**

Prerequisite



**All flex duct pulled tight-no pinches** 011915 AS

Default Value



### Description:

Any flexible ducting must have smooth, even lines, angles must not exceed 90 degrees (no "U" shapes) and must minimize duct runs. There must be no pinching or bunching (extra material), or areas where the airflow is restricted.

Provide photographs showing flexible ducting

### Benefit:

Flexible duct that is pulled tight permits maximum airflow. Pinched ducts restrict airflow and reduce the efficiency of mechanical equipment.

### Considerations

- Restricted airflow can reduce the efficiency of equipment.
- Pinched or excessive duct runs can collect dust and particulates, blocking airflow.
- Dryer vents with flexible ducting are NOT recommended – they can be a fire hazard.

### Verification:

Visually inspect and photograph implementation of this measure.



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## 6.1.0 - Yes

Accountability Form: **HVAC**

Prerequisite



**No new unvented combustion units, with the exception of kitchen-type cooking devices with exhaust ventilation** 011815 AS

Default Value



### Description:

- Combustion units including dryers, furnaces, and water heaters must vent directly from the unit through sealed and continuous ducting to the exterior of the home.
- The ducting must be rigid type, not flexible ducting
- The ducting must not have kinks or angles greater than 90 degrees
- A Worst Case Combustion Spillage Test is recommended if atmospheric combustion equipment exists in the home

### Exceptions

- Gas cook tops or ranges that have ventilation (vent hood or downdraft) to the exterior are exempt
- Propane heaters which are properly connected and checked for leakage are exempt

### Benefit:

Combustion equipment can emit moisture, carbon dioxide, carbon monoxide, and toxins into the air. It is unhealthy, at best and dangerous at worst to contain these elements within the house.

### Considerations

Flexible ducting on dryers should not be used. Lint can accumulate along the length of the ducting and can be a fire hazard. If the furnace and water heater vent through a chimney flue, make sure there are proper dampers and screening at the exit point. Check regularly the condition of the chimney to make sure animal nests are not blocking the exhaust, and that the chimney is not crushed.

Adequate make-up air may not be present to make operation of a gas dryer, gas range, water heater, and furnace safe. Whenever air leaves the home, new air must be brought in to replace it. If this volume of air is not adequate, it can cause these appliances and equipment to backdraft carbon monoxide.

Operating a propane heater in a home can be dangerous. Improper operation, leaks, and faulty valves can have fatal consequences. Make sure carbon monoxide detectors are operating properly, and consider having a mechanical contractor test for leaks and overall operation.

### Resources

Contact a local energy rater for performing a Worst Case Combustion Spillage Test.

### Verification:

See accountability form.



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**6.1.2 - Yes**

Accountability Form: **HVAC**

Prerequisite



**No equipment is permitted that intentionally produces ozone as a product rather than as an incidental by-product** 011815 AS

Default Value



**Description:**

Equipment labels or other, which describe the equipment as ozone generators in the form of air cleaners and other ozone generating devices.

**Exceptions**

Normal equipment use such as air conditioners and aerosols, which do not use CFC (chlorofluorocarbons), are allowed. CFC use has been phased out and replaced with HCFCs. HCFCs are also ozone depleting, and are discouraged. Look for new equipment that does not use CFCs or HCFCs. There are alternates such as hydrocarbon-based coolants.

**Benefit:**

When ozone is breathed, it can damage the lungs and is a known asthma trigger. Incidental by-product is the greater effect on the environment of using these products.

**Considerations**

Be aware of terminology like "energized oxygen" or "pure air" as they are indicators that the product may produce ozone

**Resources**

For more information about ozone producing equipment, visit [www.epa.gov/iaq/pubs/ozonegen.html](http://www.epa.gov/iaq/pubs/ozonegen.html)

**Verification:**

See accountability form.

**6.1.2 - Yes**

Accountability Form: **HVAC**

Prerequisite



**All new ductwork in unconditioned space insulated. (attics = R-30 min.) (walls = R10 min.)** 011915 AS (PREREQ)

Default Value



**Description:**

Ducting in unconditioned space must be insulated using either formaldehyde-free batt insulation or two-part spray applied insulation to achieve R-values indicated above. Also, the building cavity carrying the ductwork can be insulated to qualify.

**Benefit:**

Cold and hot air from the unconditioned space can enter the home through the ductwork. The closer in temperature the ductwork is to the conditioned part of the house, the less likely it is to transfer heat or cold to the space.

**Verification:**

Verifier visually confirms and photographs this measure.



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### 6.1.3 - Yes

Accountability Form: **HVAC**

Prerequisite



**No air handlers or conditioning equipment shall be placed in unconditioned spaces (e.g., garage) (condensers located outside is o.k.)** 011815 AS

Default Value



#### Description:

- Equipment must be placed in a room within the insulated building envelope
- Air handlers and other conditioning equipment must be in a location which is readily accessible for maintenance and cleaning

#### Exceptions

Un-insulated basements where heating ducts and pipes are contained are acceptable. If air handlers and conditioning equipment are to be located in an attic space, the attic envelope must be insulated, creating a conditioned space. A crawl space must be treated as conditioned (insulation and air must be exchanged between the basement and crawl space, or home and crawl space) in order for equipment to be located in this area.

#### Benefit:

Air handlers or conditioning equipment that is placed in unconditioned space is far less energy efficient

Air handlers and conditioning equipment must work harder to heat or cool the air and will reduce the lifespan of the equipment

#### Considerations

Garages and unconditioned attics are especially problematic for air handlers and conditioning equipment because they can pick up dirt, dust, and pollution from car exhaust and carry it through the home.

#### Resources

The following document has extensive information about air handling equipment and ideal locations for this equipment throughout the home, [www.eere.energy.gov/buildings/info/documents/pdfs/air\\_dist\\_sys\\_design-0782.pdf](http://www.eere.energy.gov/buildings/info/documents/pdfs/air_dist_sys_design-0782.pdf)

#### Verification:

See accountability form.



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### 6.1.3 - Yes

Accountability Form: **HVAC**

Prerequisite



**No building cavities can be used as ductwork. (i.e. no panning of joist or wall cavities for duct supply or return)** 011915 AS (PREREQ)

Default Value



#### Description:

New ducts are not to utilize the building envelope in lieu of sheet metal or flexible ducts. This includes NOT “panning” joists and wall cavity spaces between studs (see OPR-7 for requirements, rationale and resources)

All new cold air returns must be ducted

#### Benefit:

It may seem desirable at first to avoid the time and expense of installing rigid ducting, especially if the home already uses the wall and floor cavities as ductwork, however, it should never be considered because of the greater risks. Building cavities are never sealed well enough to serve as a ducting. If existing joist and wall spaces are used as air distribution supplies and returns, strongly consider installing rigid ducting. Kitchen and bath exhaust fans should never use wall and floor cavities as ducting without the use of sheet metal or pre-formed ducts.

#### Considerations

When return air moves through building cavities, it can pick up impurities and redistribute them throughout the house. There is a high risk of introducing moisture into building cavities when they are used as ducts.

#### Resources

[www.homeenergy.com/archive/hem.dis.anl.gov/eehem/93/930920.html](http://www.homeenergy.com/archive/hem.dis.anl.gov/eehem/93/930920.html)

#### Verification:

Verifier visually confirms and photographs this measure.





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## 6.1.5 - Yes

Accountability Form: **HVAC**

Prerequisite



**All new ductwork must be sealed** 011815 AS

Default Value



### Description:

Use water-based mastic or metal tape, which is specifically intended for duct sealing. Duct Tape is NOT acceptable, as it is not long lasting.

Seal all connections between ducts and connections at vents and registers.

New cold air returns are also required to be sealed.

### Benefit:

- Sealing ductwork is important for the following reasons:

- Comfort: Sealing and insulating ducts can help with common comfort problems, such as rooms that are too hot in the summer or too cold in the winter.

- Health: Sealing ducts can help improve indoor air quality by reducing the risks of pollutants entering ducts and circulating through your home. Fumes from household and garden chemicals, insulation particles, and dust can enter your duct system through leaks and can aggravate existing asthma and allergy problems.

- Safety: During normal operation, gas appliances such as water heaters, clothes dryers, and furnaces release combustion gases, like carbon monoxide, through their ventilation systems. Leaking ductwork in your heating and cooling system may cause backdrafting, where these gases are drawn into the living space, rather than expelled to the outdoors. Sealing leaks can minimize this risk.

- Save money: Leaky ducts can reduce heating and cooling system efficiency by as much as 20 percent. Duct sealing and insulating increases efficiency, lowers your energy bills, and can often pay for itself in energy savings. Plus, if you're planning to install new heating and cooling equipment, know that a well designed and sealed duct system may allow you to downsize to a smaller, less costly heating and cooling system.

- Protect the environment: Energy generation is one of the largest contributors to greenhouse gases. By sealing your ducts and reducing the amount of energy necessary to comfortably heat or cool your home, you can reduce the amount of air pollution generated.

### Considerations

A poorly functioning, or poorly sized furnace for new duct runs can lead to inefficient operation, or worse, health issues. Have a mechanical contractor review the size of the furnace to verify that it is adequate for the number of duct runs (new and existing), and that it is functioning properly.

### Resources

[www.energystar.gov](http://www.energystar.gov)

[www.energystar.gov/index.cfm?c=home\\_improvement.hm\\_improvement\\_ducts](http://www.energystar.gov/index.cfm?c=home_improvement.hm_improvement_ducts)

### Verification:

Visually inspect and photograph implementation of this measure.



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## 6.1.6 - Yes

Accountability Form: **HVAC**

Prerequisite



**New ducting MAY NOT use building cavities as part of air supply or return system.** 011815 AS

Default Value



### Description:

New ducts are not to utilize the building envelope in lieu of sheet metal or flexible ducts. This includes NOT “panning” joists and wall cavity spaces between studs.

All new cold air returns must be ducted

### Benefit:

It may seem desirable at first to avoid the time and expense of installing rigid ducting, especially if the home already uses the wall and floor cavities as ductwork, however, it should never be considered because of the greater risks. Building cavities are never sealed well enough to serve as a ducting. If existing joist and wall spaces are used as air distribution supplies and returns, strongly consider installing rigid ducting.

Kitchen and bath exhaust fans should never use wall and floor cavities as ducting without the use of sheet metal or pre-formed ducts.

### Considerations

When return air moves through building cavities, it can pick up impurities and redistribute them throughout the house.

There is a high risk of introducing moisture into building cavities when they are used as ducts.

### Resources

[www.homeenergy.com/archive/hem.dis.anl.gov/eehem/93/930920.html](http://www.homeenergy.com/archive/hem.dis.anl.gov/eehem/93/930920.html)

### Verification:

Visually inspect and photograph implementation of this measure.

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## 6.1.7 - Yes

Accountability Form: **HVAC**

Prerequisite



**All New bath fan ducting that is in unheated space shall be insulated to min R8** 011815 AS

Default Value



### Description:

Bath fan ducting must be insulated using either formaldehyde-free batt insulation or two-part spray applied insulation to achieve R-8. Also, the building cavity carrying the ductwork can also be insulated using rigid insulation to R-8 at all exterior walls and seams taped or sealed closed.

### Benefit:

Insulating ductwork that carries very moist air helps prevent condensation from occurring inside the duct during cold times of the year.

Energy loss through ductwork can occur when passing through unconditioned space. Insulating all ductwork in unconditioned spaces is very important, especially ductwork that may not be sealed as well, like bath fan ductwork.

### Considerations

Condensation that freezes on un-insulated ducts eventually melts and becomes moisture or water inside the joist space or wall cavity leading to mold problems.

Oftentimes, water leaking through a bath fan is not a roof leak, but rather condensation leaking through the fan. It can diminish the lifespan of the fan, as well as present a fire hazard.

### Resources

Visit [www.energytrust.org/TA/hes/weatherization/attic.html](http://www.energytrust.org/TA/hes/weatherization/attic.html)

### Verification:

Visually inspect and photograph implementation of this measure.



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## 6.1.8 - Yes

Accountability Form: **HVAC**

Prerequisite



**All new cooling and heating equipment must be installed with a programmable thermostat**

**--AND-- it must be programmed** 011815 AS

Default Value



### Description:

A receipt, specification page, or photograph of the programmable thermostat

Educate homeowner on how to properly set the thermostat—most homeowners do not know how to properly set a programmable thermostat, rendering the energy saving potential useless.

Make sure the thermostat has an ENERGY STAR label.

### Benefit:

A programmable thermostat saves energy when programmed properly to set back temperatures during sleeping and while away during the day.

In winter months, set away or sleeping temperatures cooler than desired when present. In summer months set the away temperatures warmer than desired when present.

### Considerations

Most homeowners do not know how to properly set a programmable thermostat, rendering the energy saving potential useless.

### Resources

<http://www.energystar.gov>

### Verification:

See accountability form.

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### 6.1.9 - Yes

Accountability Form: **HVAC**

Prerequisite



**No new air handling equipment shall be installed in a garage. If existing, it must be in a room sealed off from automobile emissions, and with fresh air supply as required by mechanical equipment within.** 011815 AS



Default Value

#### Description:

A visual inspection is required to verify that no air handling equipment, or return air is provided in the garage.

#### Exceptions

If existing equipment HVAC equipment is in the garage, an insulated sealed room with a sealed door must be built around it to overcome the below risks.

#### Benefit:

Since the garage is outside of the conditioned envelope of the house, HVAC systems that are in the garage run less efficiently.

Equipment and return air provided in the garage can pick up contaminants and distribute them throughout the home

#### Considerations

When air handling equipment is in the garage there is great risk of garage toxins getting into the air distribution system and spreading throughout the house.

#### Resources

Home Ventilating Institute, [www.hvi.org](http://www.hvi.org)

#### Verification:

See accountability form.

## 6.2 Ventilation and Fresh Air for Occupants





Lot: test 1 - 920 Cherry St Se, Grand Rapids, MI 49516

## 6.2.0 - Yes

Accountability Form: **HVAC**



**Design and install a whole house fresh air ventilation system.** This system must meet the requirements of ASHRAE 62.2 or equivalent. 0 3 0 0 0

### Description:

This system must meet the requirements of [ASHRAE 62.2](#) or the equivalent. Whole house ventilation systems include balanced systems, energy recovery ventilation, and heat recovery ventilation. All have their pros and cons, therefore consult with a mechanical contractor or engineer on the best system for a home.

### All air intakes must be away from exhaust

Drawing air into the home from a location near where air is exhausted from the home can bring unwanted moisture, odors, and fumes along with it. Placing intakes a minimum of 10' from exhaust air (including potential car exhaust) helps keep incoming air cleaner.

### Benefit:

A GreenStar home is likely going to be a tight home. In order to make up for this there must be a fresh air system installed, especially if 3 Air Changes Per Hour (or less) is the goal of the project.

### Considerations

Unbalanced systems, unlike ERVs or HRVs, do not temper the air before it enters the home requiring more energy to heat and cool the new air.

Check local code requirements to see if an alternate fresh air supply calculation from ASHRAE 62.2 is required.

### Resources

Minnesota Rules, Chapter 1322 Residential Energy Code.

### Exceptions

Building Science Corporation have also released viable standards for ventilation. GreenStar may consider these as alternative to ASHRAE.

<http://buildingscience.com/documents/special/ventilation-new-low-rise-residential-buildings>

### Verification:

Submit calculations and specifications of ventilation equipment being installed.

**6.2.2 - Yes**Accountability Form: **HVAC****Specify proper ventilation of the bathroom(s).**

100% of all bathrooms 2 3 0 4 0

**Description:**

Add in an Energy Star Fan, 1 Sone, with proper CFM & smooth rigid duct required.

Every bathroom and kitchen must be equipped with an air exhaust system. Other rooms that have the potential for high moisture levels or VOC levels, based on how they are used, should also have an air exhaust system.

- Typical air exhaust systems include the following.

- Exhaust fan, which exhausts to the exterior and not in the attic.

- System in which the exhaust duct is incorporated into a central heat recovery ventilator and fresh air supply.

Any exhaust system that is installed must exhaust air to the outdoors with a smooth rigid duct for optimal efficiency. Non-smooth ducts restrict airflow.

- For kitchens:

- 100 cfm minimum is recommended.

- Range hoods are most common and typically most effective, however standard bathroom exhaust fans can also be used effectively when a range hood may be difficult to install.

- Kitchen fans 75 cfm or smaller can be no louder than 2.0 sones and move a minimum of 1.4 cfm/watt. Fans 76 cfm or larger must be no louder than 1.5 sones and move a minimum of 2.8 cfm/watt. (EC, 41.1)

- Intentional make-up air system is required for any kitchen exhaust fan that exceeds 150 cfm.

- Check the fan specifications to be sure it is wired properly and rated for installation in the location you intend to put it.

- Look for a fan with the highest CFM/watt rating.

**Benefit:**

When moisture levels in the home are too high it degrades finishes and building materials. It also creates a condition that is conducive to mold growth, which can be a serious health hazard.

**Considerations**

A Worst Case Combustion Spillage Test is recommended if there are atmospherically venting appliances or appliances with a constant pilot such as an antique stove in the home. This test ensures that any combustion equipment or appliances are not backdrafting into the home when bath and kitchen vents are turned on. Combustion spillage can leak contaminants into the home, including carbon monoxide.

**Resources**

[Indoor Air Plus Ventilation](#)

**Verification:**

Rater to inspect proper install of bath fans or ventilation in relevant bathrooms in the house and ensure it meets standards.

**6.2.3 - Yes**Accountability Form: **HVAC****Properly Ventilate the Kitchen**

HRV or ERV used to do this 2 2 0 2 0

**Description:**

Every kitchen must be equipped with an air exhaust system. Other rooms that have the potential for high moisture levels or VOC levels, based on how they are used, should also have an air exhaust system.

- Typical air exhaust systems include the following.

- Exhaust fan, which exhausts to the exterior and not in the attic.

- System in which the exhaust duct is incorporated into a central heat recovery ventilator and fresh air supply.

Any exhaust system that is installed must exhaust air to the outdoors with a smooth rigid duct for optimal efficiency. Non-smooth ducts restrict airflow.

No recirculation

- 100 cfm minimum is recommended.

- Range hoods are most common and typically most effective, however standard bathroom exhaust fans can also be used effectively when a range hood may be difficult to install.

- Kitchen fans 75 cfm or smaller can be no louder than 2.0 sones and move a minimum of 1.4 cfm/watt. Fans 76 cfm or larger must be no louder than 1.5 sones and move a minimum of 2.8 cfm/watt. (EC, 41.1)

Exceptions - Show calculations that an ERV or HRV will ventilate the kitchen

- Intentional make-up air system is required for any kitchen exhaust fan that exceeds 150 cfm.

- Check the fan specifications to be sure it is wired properly and rated for installation in the location you intend to put it.

- Look for a fan with the highest CFM/watt rating.

**Benefit:**

Non-ENERGY STAR-rated fans typically use a lot of electricity relative to how much air they move. Replacing them with an ENERGY STAR-rated fan will save energy, and will have a net cost savings and a net benefit to the environment in the long run.

**Considerations**

Even though a fan may be operating properly, a noisy fan may not be used as much as a low noise (low sone) fan.

The embodied energy of replacing an operable bath fan is far outweighed by the energy savings of a new ENERGY STAR fan.

**Resources**

[Indoor Air Plus Ventilation](#)

**Verification:**

Rater to ensure hoodrange is the correct model, installed and ducted correctly.



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## 6.2.4 - Yes

Accountability Form: **Electrical Contractor**



### Bathroom automatic controls for ventilation

75% of Bathrooms 2 3 0 3 0

#### Description:

Various automatic controls, including consolidating the fan and light switch, manual timers, programmable timers, motion sensors, and dehumidistats are all available to help ensure exhaust fans are run optimally.

#### Benefit:

Typically, if the fan is on its own switch it is not convenient for the occupants of the house to turn the fan on and off at times that contribute to optimal indoor air quality. A good rule of thumb is for fans to at least be run when the room is occupied, and typically they should run for an extended period of time after the occupant has left the room. To choose the best controls to work in concert with the other ventilation systems in your house it may be advisable to consult with a knowledgeable professional.

#### Considerations

Make sure the most appropriate automatic control is added to the fan and light switch. Different types may be frustrating based on the occupant's use of the space. Consult with an electrician as to the most appropriate controls for the home and occupant

#### Resources

ENERGY STAR: [www.ENERGY STAR.gov/index.cfm?c=vent\\_fans.pr\\_vent\\_fans](http://www.ENERGY STAR.gov/index.cfm?c=vent_fans.pr_vent_fans)

Energy Federation Incorporated: [www.efi.org](http://www.efi.org)

#### Verification:

Rater to review control installs and that it is functioning



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## 6.2.9 - Yes

Accountability Form: **HVAC**



### Heat or energy recovery ventilator installed

0 2 0 1 0

#### Description:

An HRV or ERV uses the air that is being exhausted to either pre-heat or pre-cool the incoming fresh air. These devices act like lungs for the home by bringing in fresh air and exhausting stale air.

If your home will test at 3 air changes per hour or less, it is highly recommended to instal one of these.

#### Benefit:

A heat recovery ventilator (HRV) can save energy and heating costs by pre-heating or pre-cooling incoming fresh air with warm or cool air, which is being exhausted. An HRV can help lower humidity in the home during the winter months.

#### Considerations

An ERV or HRV does not transfer any of the humidity back into or out of the home. An ERV or HRV can dry a house more than may be comfortable, possibly requiring the addition of a humidification system.

#### Resources

Energy Federation Incorporated, [www.efi.org](http://www.efi.org)

#### Verification:

Rater to inspect install. HVAC to sign accountability form