MISSISSIPPI WEATHERIZATION PROGRAM
Pre
HOME ENERGY INSPECTION FORM

CUSTOMER NAME:_____PHONE #:_____

Address _____Retro Type _____

Job Number: _____ Pre Assess Date: _____ Pre Assessor:_____

Date work started: _____ Date Work was completed: _____

Home Information:
Occupants _____ Square ft._____ Ceiling ht _____ Volume_____

Age of Home_____

BAS	
Pre CFM 50	
MVR	

Complete the building Airflow Standards Worksheet on Page 2 and fill in box.

Appliances	Fuel Type	Pass	Repr	Repl	Rem	NOTES
Water Heater	Natural Propane Butane Elec None					
Cook Stove	Natural Propane Butane Elec None					

Heating Systems	Fuel Type	Unit Type	Pass	Repr	Repl	Rem	NOTES
PRIMARY UNIT	NG P BU E W	FA VSH USH G					
Secondary Unit # 1	NG P BU E W	FA VSH USH G					
Secondary Unit # 2	NG P BU E W	FA VSH USH G					
Secondary Unit # 3	NG P BU E W	FA VSH USH G					
Secondary Unit # 4	NG P BU E W	FA VSH USH G					

Repairs needed before start weatherization:	Air Seal	Insulate	Other
COMPLETE _____Date_____	Attic Bypass____ Floor Bypass__ Seal Ducts____ Doors_____ Windows_____ W/S___ D/S___ Other_____	Attic _____ MH Ceil ___ Swall_____ Floor_____ Belly _____ Ducts _____ WH _____ Pipes_____	A/C _____ Dryer _____ Exhaust ____ Pop Off ____ Belly Rep___ Poly_____ Roof Coat___

Lead pamphlet___ Mold pamphlet ___ CO Video ___ Annual fuel cost ____ Outdoor Temp (pre_____)
Lead Swipe Test completed ____

Smoke Detectors Yes No Locations _____ Test _____ Need_____

CO Detectors Yes No Locations _____ Test _____ Need _____
Building Airflow Standards Worksheet

Building Data should always be determined prior to calculating required Ventilation.
Living Space or area
Number occupants including pets, smokers count as two people
Stories above grade (upstairs)
Stories below grade (basement, if applicable)
N = natural airflow. Mississippi will use 21.5
BAS= Building Air flow Standard/Target
Cfm= cubic feet per minute
Airflow= Volume x .35 ÷ 60
MVR= Minimum Ventilation Rate
Number of bedrooms

Calculating ventilation required for home.
Input the data and complete the formula below. When completing the formula remember to complete the work inside the parenthesis first.

1. Volume= Length x Width x Height = _____ Cubic Ft

2. Airflow (b) = _____ x .35 ÷ 60
   Volume

3. Calculating the ventilation required for a home per occupant

   Airflow (p) = 15 x _____ = _____ CFM
   Occupants

4. Using the highest of the two cfm airflow formulas convert to cfm 50

Cfm50 = _____ x 21.5= _____
Cfm N-factor Building Airflow Standard/Target

5. MVR = (.7 x BAS) = _____
   (MVR)

6. The BAS is considered our target. This is the maximum amount of airflow allowed to circulate throughout this dwelling. The MVR is the minimum amount of airflow allowed without mechanical ventilation. If the Cfm 50 reading falls below the (BAS) it is recommended that mechanical ventilation be added to the home. If the Cfm 50 reading falls below the MVR then it is a requirement to install mechanical ventilation into this home for the health and safety of the client. Please use the formula listed below.

(Area x 0.03) + (_____ +1 x 7.5) = _____
# of Bedrooms — CFM Ventilation Required

7. Alternative Compliance Supplement Calculation #1
   All bathrooms require 50 Cfm. All kitchen range hoods require 100 Cfm. Be advised that if a window is present subtract 20 Cfm from the original required amount of Cfm. Be advised that the 20 Cfm credit is only given 1 time per room. These calculations should be completed on each bathroom individually.

   Bathroom= 50 Cfm Required - _____ - _____ = _____
   Cfm Existing — Operable Window — Cfm Deficit

   Kitchen= 100 Cfm Required - _____ - _____ = _____
   Cfm Existing — Operable Window — Cfm Deficit

8. Alternative Compliance Supplement Calculation #2
   This is based on the on demand requirements. We will add capacity to the whole home continuous fan, so we can reduce the deficit. We will then divide the deficit by 4.

_____ + _____ = _____
Kitchen Range Hood Cfm | Bathroom Fan Cfm | Total Deficit

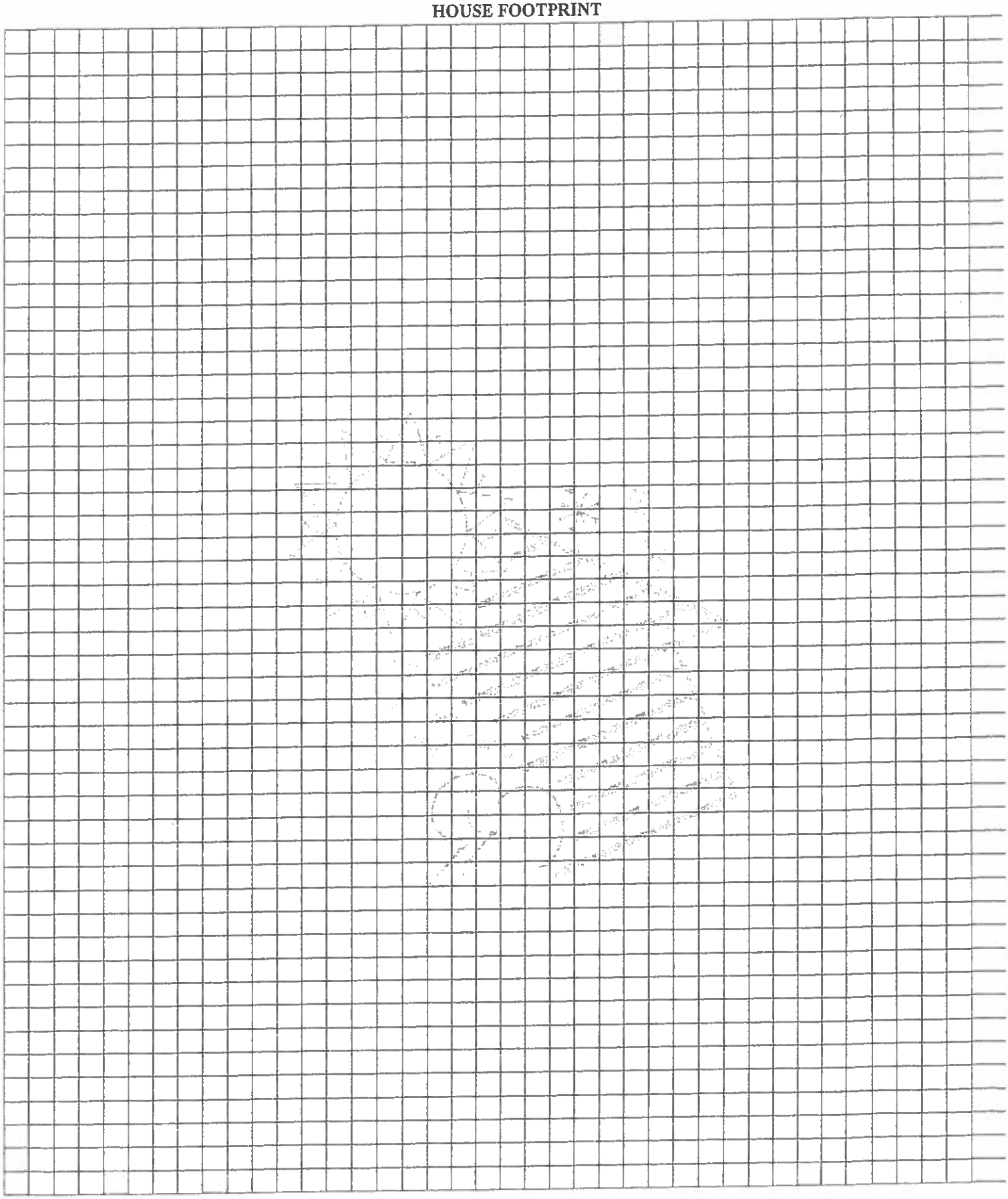
Cfm Deficit ÷ 4 = _____
Cfm

9. Calculate the infiltration credit = ½ (Icfm-Id)
   Icfm = 0.0508xWxSxQ50
   Id = 0.03xarea of home
   W = weather factor
   S = number of stories
   Q50= Blower door reading

   1/2(.0508× _____ × _____ × _____) - (0.03 x _____) = Cfm credit
   W | S | Q50 | square footage of the home

10. Cfm fan= _____ + _____ - _____ = _____
    Cfm | Cfm Deficit | Cfm Credit | Cfm fan

HOUSE FOOTPRINT



HOUSE (Existing Electrical Information)					
Electric Box	Manufacturer	Size Box	Cover	Type	Location
Outside Panel		Amp	Y N	Breaker Fuses	
Inside Panel		Amp	Y N	Breaker Fuses	
COMMENTS:					

	EXHAUST VENTS	Operational	Vented to the Outside	Cfm	S:
1	Dryer Vent	Y N None	Y N		
2	Kitchen Exhaust	Y N None	Y N		
3	Bathroom Exhaust	Y N None	Y N		
4	Other _____	Y N	Y N		

GAS COOKSTOVE INSPECTION			STOVE PART (Carbon Monoxide)	Pre (ppm) CO CF		COMMENTS:
1	Gas Stove Present	Y N	Oven			
2	Gas Leak	Y N	Front Left			
3	If so, Location of Leak?		Front Right			
4	Type of Fuel	NG LP BU	Rear Left			
5	Make of Stove		Rear Right			

Vented Range Hood Present? YES NO

Flex Connector Type SS___ Epoxy Coated___ Hard Piped___ Copper ___ *Brass*___ * MUST REPLACE CONNECTOR*

UNVENTED SPACE HEATERS		
1	Loc _____ Make _____ Model # _____ BTU Input _____ Ventable Yes No CO ___ ppm Primary or Secondary Gas Shutoff Yes No Gas Leak Yes No IF Yes, Location _____	
2	Loc _____ Make _____ Model # _____ BTU Input _____ Ventable Yes No CO ___ ppm Primary or Secondary Gas Shutoff Yes No Gas Leak Yes No IF Yes, Location _____	
3	Loc _____ Make _____ Model # _____ BTU Input _____ Ventable Yes No CO ___ ppm Primary or Secondary Gas Shutoff Yes No Gas Leak Yes No IF Yes, Location _____	
4	Loc _____ Make _____ Model # _____ BTU Input _____ Ventable Yes No CO ___ ppm Primary or Secondary Gas Shutoff Yes No Gas Leak Yes No IF Yes, Location _____	
5	Loc _____ Make _____ Model # _____ BTU Input _____ Ventable Yes No CO ___ ppm Primary or Secondary Gas Shutoff Yes No Gas Leak Yes No IF Yes, Location _____	
Comments:		

Water Heater Inspection			UNIT Description
1	Pass	Fail (If Fail Why) Repair or will Replace with	
2	Location_____ Type of Fuel Natural Propane Butane Electric		
3	Make _____ Model _____ Serial Number_____		
4	Rated BTU Input _____ Size ____Gal Measured Temperature_____ degF		
5	Gas Leaks ? Yes No If Yes, Location of Leak _____		
6	IF Natural Gas (Clock Meter) Dial _____cu ft ____sec = _____ BTU Is this within 10% of Rated BTU? Yes No		
7	Can Water Heater be Insulated? Yes No Can Insulate First 5 feet of Hot Water Line? Yes No Can Insulate First 5 feet of Cold Water Line? Yes No	Is Pressure Relief Piping Needed? Yes No Is there Evidence of Flame Roll out? Yes No Is Pilot Safety Shutoff OK? Yes No	
8	Is Main Vent / Chimney O.K. ? (circle any problems below)		Yes No
	Type, Location, Clearance, Height, Size, Cap, Liner, Mortar, Flashing, Unused flue holes, Thimble, Other _____ Chimney Type _____ Chimney Size _____inches Chimney Height _____feet Liner Existing or Needed Type _____ Liner Size ____inches Height _____feet		
9	Is Vent Connector from Water Heater to Chimney O.K. ? (circle any problems below)		Yes No
	Proper type pipe, Connected properly, Leaky or Corroded, ¼" Rise per Ft, Excessive elbows, Clearance Other_____ Vent Connector Type _____ Vent Connector Size ____inches Vent Connector Run ____feet		
10	Is Combustion Air Venting Needed ? *(less than 50 cubic ft per 1000 btu's)*		Yes No
11	L_____ X W_____ X H _____ = _____Cu Ft / 50 = _____Thousand BTU Allowed		Btu Allowed
12	Sq" of NFA Combustion Air Needed = BTU Input _____ / 1000 = _____ X 2		SQ"Needed
13	Vent Size for NFA Needed (High) = W____ x H ____ = _____ *.75 = NFA Sq"		Size High
14	Vent Size for NFA Needed (Low) = W____ x H____ = _____ *.75 = NFA Sq"		Size Low

Diagnostic Inspection		PRE TESTS					
15	CAZ Worst Case WRT Outside	**Complete CAZ Sheet** then recreate worst case PA					
16	Draft (Worst Case)	Wc		PA			
17	CO Living Area			PPM			
18	CO Flue Gases <100ppm			PPM			
19	CO Flue Gases (Air Free) <400ppm			PPM			
20	Stack Temperature (each port)			Deg F			
21	Oxygen Percentage (each port)			O2 %			
22	Efficiency Percentage (each port)			Eff %			

Heating Unit Safety Inspection		UNIT Description
1	Pass	Fail (If Fail Why) Repair or will Replace with
2	Location_____ Type of Fuel Natural Propane Butane Elec Wood Type of Unit FA VSH USH G	
3	Make _____ Model _____ Serial Number_____	
4	Rated BTU Input _____ Rated BTU Output_____ IF Natural Gas (Clock Meter) within 10% Yes No	
5	Thermostat Location_____ Mercury? Yes No Temp Day_____ Night____ Anticipator Setting ___	
6	Gas Leaks ? Yes No If Yes, Location of Leak	
7	Is Heating unit on Separate Circuit ? Yes No Circuit Breaker / Fuse Size at Service Panel _____ Is there an Electrical Disconnect ? Yes No Circuit Breaker / Fuse Size at Disconnect _____ Are there any Burned Wires? Yes No Visual Inspection of Safety Controls? Yes No	
8	Filter Location _____ Type _____ Not installed ___ Clean ___ Dirty ___ Cleaned and Replaced___ Filter Size _____X_____ Qty _____ Does Blower Need Cleaning? Yes No Noisy? Yes No	
9	Is Main Vent / Chimney O.K. ? (circle any problems below)	Yes No
	Type, Location, Clearance, Height, Size, Cap, Liner, Mortar, Flashing, Unused flue holes, Thimble, Other _____ Chimney Type _____ Chimney Size _____inches Chimney Height _____feet Liner Existing or Needed Type _____ Liner Size ____inches Height ____feet	
10	Is Vent Connector from Heating System to Chimney O.K. ? (circle any problems below)	Yes No
	Proper type pipe, Connected properly, Leaky or Corroded, ¼" Rise per Ft, Excessive elbows, Clearance Other_____ Vent Connector Type _____ Vent Connector Size ____ inches Vent Connector Run ____ feet	
11	Is Clearance from Heating Unit to Combustibles OK? (Ceiling, Walls, Floors)	Yes No
12	Is Heat Exchanger O.K. ?	Yes No
13	Is this Unit Sealed Combustion	Yes No
14	Is Combustion Air Venting Needed ? *(less than 50 cubic ft per 1000 btu's)*	Yes No
15	If Yes, How Many SQ Inches Needed?	SQ"

Diagnostic Inspection		PRE TESTS											
16	CAZ Worst Case WRT Outside	**Complete CAZ Sheet** then recreate worst case PA											
17	Draft Inducer and Pressure Switch	Yes No			Switch pass Yes No								
18	Draft (Worst Case)	Wc					PA						
19	CO Living Area						PPM						
20	CO Flue Gases <100ppm						PPM						
21	CO Flue Gases (Air Free) <400ppm						PPM						
22	Stack Temperature (each port)						Deg F						
23	Oxygen Percentage (each port)						O2 %						
24	Efficiency Percentage (each port)						Eff %						
25	Heat Rise (Supp-Ret temp) deg F	Supply		Return		Rise							

COMMENTS:

Vented Fireplace? Yes No Location _____ How often used? _____
Damper? Open Closed None Operable? Yes No Seal off if not Used? Yes No

PRE TEST COMBUSTION APPLIANCE ZONE TESTING:

How do we do Combustion Appliance Zone Testing?:

Place combustion appliances on PILOT.
Setup for natural conditions and measured baseline pressure differential
Measure the Base Pressure.
Start with all exterior doors, windows, and fireplace damper(s) closed.
Set all combustion appliances to the pilot setting or turn off the service disconnect, including: boiler, furnace, space- heaters, and water heater.
With the home in this configuration, measure and record the base pressure of the combustion appliance zone with reference to outside.
Record Pressure _____Pascals

Created worst case conditions
Establish the Worst Case.
Turn on all fans in home — bath fans, exhaust hood and air handler
Make sure all exterior doors are closed
Ensure the damper to fireplace is closed
Close interior doors (unless there is a fan behind it), check pressure now.
Close bedroom door, recheck pressure to see if it became more negative
Record most negative Pressure_____Pascals

Correctly measured worst-case CAZ Depressurization
Natural Pressure:_____
Worst Case Pressure:_____
Difference_____(remember it is the distance it takes to get from natural to worst and is a negative number) Use the difference on the table below:
You want your difference to be less negative than the number on the table (i.e. if limit is -2 then your number should be > -2)

CAZ Depressurization Limits
You want your difference to be less negative than the number on the table (i.e. if limit is -2 then your number should be >-2) to cool between tests. IF IT STILL FAILS THEN A SERVICE MUST BE PERFORMED.
Performed worst case draft test
Measure Worst Case Draft. Test the draft in the flue/connector 1-2' after the diverter or first elbow.
Measure the pressure in the Combustion Appliance Zone with reference to the pressure inside the flue.
What if the pressure reading?
What is temperature outside?
Acceptable Draft Test Ranges

Outside Temperature (degree F)	Minimum Draft Pressure Standard (Pa)
<10	-2.5
10-90	(T-out /40)-2.75
>90	-0.5

Reading on manometer_____Pascals — reading should be more negative than table above.
If it is 80 degrees outside then: 80/40 = 2 and 2 — 2.75 = -.75
The pressure on the manometer should be <-.75
If measured draft is below minimum draft pressures, investigate the reason for the weak draft. Open a window or door to observe whether the addition of combustion air will improve draft. If this added air strengthens draft, the problem usually is depressurization. If opening a window has no effect, inspect the chimney. The chimney could be blocked or excessively leaky
Repeat the above steps for each combustion appliance from smallest BTU to largest.
If the appliances are vented together then you will test each one individually at first then test both appliances together to verify one is not affecting the other.
Is that the final test?
No, now we need to test for Worst Case CO.
Measure Worst Case CO. Test for CO at the flue at steady state (if steady-state is not achieved within 10 minutes, take CO readings at the 10 minute mark). Test for CO in ALL appliances in the flue, before the draft diverter in undiluted flue gasses
Carbon Monoxide Tests CO shall be measured of undiluted flue gases, in the throat or flue of the appliance using a digital gauge and measured in parts per million (ppm).

Dominant Duct Leakage Test (Main Body WRT outdoors) Baseline____PA Dominant Duct _____PA

Pressure in Individual Rooms (Room WRT Outdoors) *Each room shouldn't be more than -/+ 3pa Wrt Outside*																
	Room	Bef	Inter	PR	Aft		Room	Bef	Inter	PR	Aft		Room	Bef	Inter	PR	Aft
1						5						9					
2						6						10					
3						7						11					
4						8						12					

WINDOW AIR CONDITIONER (S)

#	Location	Name	BTU	EER	Perm	Cover	Filter	Coils
1								
2								
3								
4								

COMMENTS:

CENTRAL AIR CONDITIONING / HEAT PUMPS

Outdoor Loc	Name	Model	Serial	SEER	Disconnect	Suction Line Insulation	Coil
Indoor Loc	**Name**	**Model**	**Serial**	**KW**	**X**	**Btu Input**	**Coil**

Thermostat Location_____ Mercury? Yes No Temp Day_____ Temp Night____

Filter Location _____ Type _____ Not installed ___ Clean ___ Dirty ___ Cleaned and Replaced____

Filter Size _____ X _____ Qty _____ Does Blower Need Cleaning? Yes No Noisy? Yes No

Comments:

DUCTS / HEATING PIPES

Duct Location	Cond/ Uncond	Boots	Registers	Supp Duct	Ret Duct	SuppP len	Ret Plen	Cross over	Duct Wrap	Ft Insul

COMMENTS:

Type Ductwork (Sheet Metal Flex Duct Ductboard Other ____) Type Duct System (Trunk Spider Cottage Base Other _____)

Supply Size _____OK? Yes No Return Size _____OK? Yes No | Replace return grill with Filter Grill Yes No

Heating = 400cfm per 25,000 Btu output Cooling = 400 cfm per 12,000 Btu (TON)

Blower Door

	LOCATION	CONFIGURATION	Baseline	PA	CFM	CRF	CONVERTED CFM	
Post		Open Ring A Ring B						

Comments:

48= 1.03	40= 1.16	32=1.34	24 = 1.61	16 = 2.10
46= 1.06	38= 1.20	30=1.39	22 = 1.71	14 = 2.29
44= 1.09	36= 1.24	28=1.46	20 = 1.81	12 = 2.53
42= 1.12	34= 1.28	26=1.53	18 = 1.94	10 = 2.85

Before After

Pressure Pan Test (Duct WRT House) *House WRT Duct Location ____/____ PA*

	Location	Before	After		Location	Before	After		Location	Before	After
1				8				15			
2				9				16			
3				10				17			
4				11				18			
5				12				19			
6				13				20	RETURN		
7				14							
Comments:									Pressure Pan Multipliers		

Zonal Pressures (Test WRT House and WRT Outdoors)

Zone Tested	Before		After		Zone Tested	Before		After	
	WRT House	WRT Outside				WRT House	WRT Outside		
Attic 1					Bellyboard				
Attic 2					Marriage Wall				
Crawlspace									

Comments:

50 = 1.0	25 = 2.0
45 = 1.1	20 = 2.5
40 = 1.25	15 = 3.5
35 = 1.42	10 = 5.0
30 = 1.66	5 = 10.0

Attic Weatherization	Attic 1	Attic 2	Attic 3
Insulation *(Bags Needed)*			
Dimensions			
Sq Footage			
Existing Type			
Existing R-Value			
Added Type			
Pre WX R-Value			
Condition of Attic	Attic 1	Attic 2	Attic 3
Water Leaks			
Recessed Light			
Chimney / Vent Shielding			
Condition of Wiring			
Attic Access			
By-Passes	Attic 1	Attic 2	Attic 3
Open Ext Wall Tops	Yes No	Yes No	Yes No
Open Int Wall Tops	Yes No	Yes No	Yes No
Wire, Plumbing, HVAC Chases			
Stairwell, Closet, Soffit Drops			
Ventilation	Attic 1	Attic 2	Attic 3
NFVA Sq" Needed *(Sq' x.24)*			
Sq" Existing Exhaust (High)			
Sq" Needed Exhaust (High)			
Total NFVA Exhaust Sq"			
Sq" Existing Intake (Low)			
Sq" Needed Intake (Low)			
Total NFVA Intake Sq"			

SIDEWALLS	SECTION 1	SECTION 2
Existing Insulation ?	R-_____	R-_____
Knob and Tube Wiring ?	Yes No	Yes No
Are Walls Weak ?	Yes No	Yes No
Can Sidewalls Be Blown ?	Yes No	Yes No
Type of Interior Walls ?		
Type of Exterior Walls ?		
Type of Framing ?	Balloon Stick	Balloon Stick
Width of Cavity ?	24" 16" Other_____	24" 16" Other_____
Depth of Cavity ?	2 X 4 2 X 6 Other_____	2 X 4 2 X 6 Other_____
Exterior Wall Surface ?	SQ FT	SQ FT
Less Windows/Doors ?	SQ FT	SQ FT
New SQ FT Wall Surface ?	SQ FT	SQ FT
TOTAL BAGS NEEDED	Bags	Bags

COMMENTS: (Optional: Drawings of elevations and footprint may be attached to assessment.)

CRAWLSPACE	SECTION 1	SECTION 2
Type of Foundation	Crawl Pier	Crawl Pier
Type of Sub floor	Plywood T&G Plank	Plywood T&G Plank
Total Square Ft of Floor		
Avg Wall Height above Grade		
Linear Feet of Perimeter		
Vapor Barrier Existing	Yes No	Yes No
Open Exterior or Interior Walls	Yes No	Yes No
Wire, Plumbing, HVAC Chases		
Floor Joist Size 2 x	6 8 10 12	6 8 10 12
Floor Insulation Existing	Yes No	Yes No
R-Value Existing	6 11 13 19	6 11 13 19
Floor Insulation Needed	Yes No	Yes No
R-Value Needed	R-11 R-19	R-11 R-19
Exposed Water Lines Wrapped	Yes No _____ft	Yes No _____ft

COMMENTS:

WINDOWS

#	Pass	Type	Size	Location	Glass	Lock	Clips	#	Pass	Type	Size	Location	Glass	Lock	Clips
1								11							
2								12							
3								13							
4								14							
5								15							
6								16							
7								17							
8								18							
9								19							
10								20							

COMMENTS:

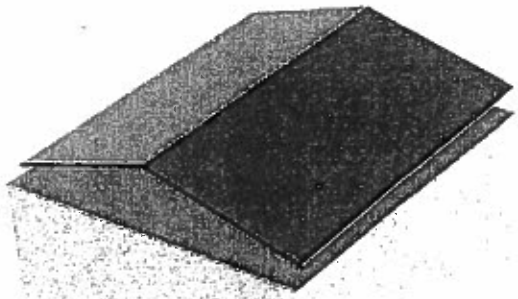
	DOORS	Operation	W/S	D/S	Lockset	Hinges	Glass
1	Front Door						
2	Back Door						
3							
4							
5							

NE = Nonexistent
✓ = OK
IN = Inaccessible
X = Address It

COMMENTS:

MOBILE HOME INSULATION

Total Bags Needed	
Catheradal Sq Ft	
Flat Sq Ft	
Total Square Footage	
Peak Height	
Existing Type	
Existing R-Value	
Added Type	
Pre WX R-Value	
Type of Roof	Shingle Metal Other
Slope of Roof	A Frame Bow-truss
Roof Blowing Access	Side Top Gable
Gutter Length	
Roof Coating	
Peal and Seal	
Plumbing Vent Caps	



Comments:

BELLYBOARD	SECTION 1	SECTION 2
Repair Needed	Yes No	Yes No
Direction of Joists	Longways Crossways	Longways Crossways
Depth of Joists	2 X 4 2 X 6	2 X 4 2 X 6
Vapor Barrier Present	Yes No	Yes No
Exposed Water Lines Wrapped	Yes No ____ ft	Yes No ____ ft
Plumbing Leaks	Yes No	Yes No
Square Feet Floor	SQ FT	SQ FT
Total Bags Needed	Bags	Bags

COMMENTS:

BASELOAD MEASURES

Refrigerator Assessment and Replacement

Brand Name	Model #	Type	Total Cu Ft	Door Hinge	Dimension	*Narrowest Sized Door	Metering kWh
		Side by Side Top Freezer Bottom Freezer		Left Right	Width ___ Depth ___ Height __	_____inches	kWh _____ Duration _____min Peak Watts _____

Other Refrigerators and Freezers Refrigerators _____ Freezers _____ Is homeowner willing to Discontinue Use if Install Larger Refrigerator / Freezer Combination? YES NO	kWh X 8760 / Duration/60 X 1.08 = _____kWh per year *What is the Narrowest Sized Door Opening that must pass thru to install Refrigerator

Comments:

Lighting Assessment and Replacement

	Room	Existing Incandescent Wattage	Replacement CFL Wattage	Type Fixture	Type Bulb Needed	Incandescent Watts	CFL Watts	Lumens
1				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
2				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
3				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
4				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
5				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
6				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
7				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
8				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
9				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			
10				Tbl Flr Ceil Wall	Quad Spiral Circ Torch			

Comments:

Water Assessment and Replacement

Aerators?
Showerheads?

INSTRUCTIONS FOR MISSISSIPPI WEATHERIZATION PROGRAM HOME ENERGY ASSESSMENT CHECKLIST

Customer Information (Page 1)

1. Enter customer's name, address, and phone number.
2. Enter driving directions to the customer's home.

Agency/Job Information (Page 1)

1. Job Number: Enter Job Number from the customer file.
2. Retro Type: Enter the type of house being weatherized (e.g., single-family house, mobile home, or multi-family building). If the dwelling has been previously weatherized, indicate that this job is a reweatherization and record the date the house was originally weatherized. The dwelling unit may not be reported as a completion if it was originally weatherized more recently than September 30, 1993.
1. Assess Date: Enter the date of the home energy assessment
2. Assessor(s): Enter the names of the people conducting the home energy assessment.
3. Date work started: Enter the date that weatherization work was started.
4. Date work complete: Enter the date that weatherization work was completed.
5. Age of home should be recorded on this assessment sheet.

Appliance and Heating System Summary (Page 1)

Note: The tables for *Appliances* and *Heating Systems* are for summary information, which is transferred from the detailed appliance and heating system information on pages 2 and 3 **after** the assessment. These summary tables are placed on page 1 so that the most important about the type of weatherization work to be done and the level of effort required for the job can be determined by quickly scanning the front page of the home energy assessment checklist.

Appliances (Page 1)

1. Water Heater: Circle the type of fuel the water heater uses. Check the appropriate columns (Pass, Repr, and/or Repl) to indicate if the water heater passed required tests, needs repair, and/or needs to be replaced as recorded during the assessment on page 3.
2. Cook Stove: Circle the type of fuel the cook stove uses. Check the appropriate columns (Pass, Repr, and/or Repl) to indicate if the cook stove passed required tests, needs repair, and/or needs to be replaced as recorded during the assessment on page 2.

Heating Systems (Page 1)

1. For the primary heating system and all secondary units, circle the fuel type (NG=natural gas, P=Propane, BU=Butane, E=Electric, W=Wood).
2. For the primary heating system and all secondary units, circle the type of unit (FA=forced-air furnace, VSH=vented space heater, USH=unvented space heater, G=Gravity furnace).
3. For the primary heating system and all secondary units, check the appropriate columns (Pass, Repr, Repl, and/or Rem) to indicate if the cook stove passed required tests, needs repair, needs to be replaced, and/or should be removed as recorded during the assessment on page 2.

Heating Systems (Page 1)

3. For the primary heating system and all secondary units, circle the fuel type (NG=natural gas, P=Propane, BU=Butane, E=Electric, W=Wood).
4. For the primary heating system and all secondary units, circle the type of unit (FA=forced-air furnace, VSH=vented space heater, USH=unvented space heater, G=Gravity furnace).
4. For the primary heating system and all secondary units, check the appropriate columns (Pass, Repr, Repl, and/or Rem) to indicate if the cook stove passed required tests, needs repair, needs to be replaced, and/or should be removed as recorded during the assessment on page 2.

Repairs and Measures to be Installed (Page 1)

1. Repairs: Note any repairs that are required before weatherization work can proceed.
2. Check the *Air Seal, Insulate, and Other* weatherization measures that are appropriate for the house.
3. When weatherization work and testing out are complete, check the blank and record the completion date.

INSTRUCTIONS FOR MISSISSIPPI WEATHERIZATION PROGRAM HOME ENERGY ASSESSMENT CHECKLIST

Other Health and Safety Items (Page 1)

1. Lead handout: In all homes built before 1978 where weatherization work may disturb painted surfaces, the EPA pamphlet entitled *Protect Your Family from Lead in Your Home* must be given to the customer. Check the blank to indicate that the customer has received a copy of the required lead brochure.
2. Lead swipe test should be completed on all homes built prior to 1978. Be advised that if there is a doubt complete the test.
3. CO Video: Check the blank if the customer has viewed the video that describes the dangers of carbon monoxide.
4. Smoke Detectors: Circle "Yes" or "No" to indicate the presence of smoke detectors. If "Yes," indicate location and if the units tested OK. If "No," indicate how many smoke detectors are needed and where they should be located.
5. CO Detectors: Circle "Yes" or "No" to indicate the presence of CO detectors. If "Yes," indicate location and if the units tested OK. If "No" and there are combustion appliances in the house, indicate how many CO detectors are needed and where they should be located.
6. Moisture Problems: Describe the nature and location of any indications of moisture problems including standing water, visible mold, or musty odors that could signal hidden mold.
7. Pollution Survey: Describe the nature and location of any indications of pollution problems including sewer leaks, infestations requiring extermination before weatherization, etc.

Utility Bills and Weather Information (Page 1)

1. Annual Fuel Costs (to the right on Lead handout and CO Video, on same line): Indicate annual utility bills for main heating fuel, if available.
2. Outdoor Temp (Pre/Post): Record outdoor temperature at the time of the pre- and post-weatherization blower door tests.
3. Wind (Pre/Post): Indicate if the weather was calm or windy at the time of the pre- and post-weatherization blower door tests.

Building Airflow Standards (Page 2)

1. Building data should always be determined prior to calculating the required ventilation.
2. Living space or area
3. Number of Occupants including pets, smokers count as two people
4. Stories above grade (upstairs)
5. Stories below grade (downstairs)
6. N= Natural airflow, Mississippi will use 21.5
7. BAS= Building Airflow Standards/Target
8. Cfm= Cubic feet per minute
9. Airflow= volume X.35÷60/ volume is ceiling ht x (width +length)
10. MVR = Minimum Ventilation Rate
11. Number of bedrooms
12. Calculating the ventilation required for a home
13. Please input the data and complete the formula below. When completing this formula remember to complete the work inside the parenthesis first.
14. Volume = _____ft ceilings X (_____W + _____L) = _____ cubic ft
15. Airflow (b) = _____ X .35÷60
    Volume

16. Calculating the ventilation required for a home per occupant
    Airflow (p) = 15 x _____ = _____Cfm
    Occupants

17. Using the highest of the two cfm airflow readings, convert this to cfm 50
18. Cfm50= _____ x 21.5 = _____
    Cfm N factor Building Airflow Standard/Target (BAS)
19. MVR= (.7 x BAS) = _____
20. The BAS is the Building airflow standard or the target. This reading should be placed in the designated spot on the on page 1 inside the box. The MVR is the Minimum ventilation rate. You blower door reading shall not fall below this number. If your blower door reading falls below this number ventilation must be added to the home. Per ASHRAE 62.2.2013

MDHS

INSTRUCTIONS FOR MISSISSIPPI WEATHERIZATION PROGRAM
HOME ENERGY ASSESSMENT CHECKLIST

21. Please use this formula to calculate the amount of ventilation required per home.
22. (Area X 0.03) + (_____ + 1 x 7.5) = _____
    Bedrooms — Cfm Ventilation Required

23. Alternative Compliance Supplement Calculation #1
All bathrooms require 50 Cfm. All kitchen range hoods require 100 Cfm. Be advised that if a window is present subtract 20 Cfm from the original required amount of Cfm. Be advised that the 20 Cfm credit is only give 1 time per room. These calculations should be completed on each bathroom individually.

Bathroom= 50 Cfm Required - _____ (Cfm Existing) - _____ (Operable Window) = _____ (Cfm Deficit)

Kitchen= 100 Cfm Required - _____ (Cfm Existing) - _____ (Operable Window) = _____ (Cfm Deficit)

24. Alternative Compliance Supplement Calculation #2
This is based on the on-demand requirements. We will add capacity to the whole home continuous fan, so we can reduce the deficit. We will the divide the deficit by 4.

_____ (Kitchen Range Hood Cfm) + _____ (Bathroom Fan Cfm) = _____ (Total Deficit)

Cfm Deficit ÷ 4 = _____ Cfm

25. Calculate the infiltration credit = ½ (Icfm-Id)
Icfm= 0.0508xWxSxQ50
Id= 0.03xarea of home
W= weather factor
S= number of stories
Q50= Blower door reading

1/2(.0508× _____ (W) × _____ (S) × _____ (Q50)) - (0.03 x _____ (square footage of the home)) = Cfm credit

26. Cfm fan= _____ (Cfm) + _____ (Cfm Deficit) - _____ (Cfm Credit) = _____ (Cfm fan)

House Footprint (Page 3)
Draw the house footprint (floor plan as viewed from above) in the space provided. Record dimensions. Note locations of windows and exterior doors. Also, note location of any obstructions or construction details that might complicate insulation or air sealing work.

House – Existing Electrical Information (Page 4)
1. Record the manufacturer, amp rating, and location of the outside or inside electrical panel. Indicate if the panel has fuses or circuit breakers and if it has a cover.

Exhaust Vents (Page 4)
1. For the Dryer Vent, Kitchen Exhaust, Bathroom Exhaust, and Other exhaust vents, indicate if the vent is operational by circling "Y" for Yes, "N" for No, or "None" if there is no vent. Circle "Y" or "N" to indicate if the vent exhausts to the outside.
2. For the Kitchen Exhaust, Bathroom Exhaust, and Other exhaust vents, record the CFM from the flow pan measurement. The air flow of kitchen exhaust fans may be difficult to test with standard flow pans.

INSTRUCTIONS FOR MISSISSIPPI WEATHERIZATION PROGRAM HOME ENERGY ASSESSMENT CHECKLIST

Gas Cook Stove Inspection (Page 4)

1. Gas Stove Present: Circle "Y" or "N" to indicate the presence of a gas cook stove.
2. Gas Leak: Circle "Y" or "N" to indicate the presence of a gas leak. If there is a gas leak, note its location (e.g., supply line before connection to stove, at stove/supply line connection, at burner feed tube, etc.)
3. Type of Fuel: Indicate the type of fuel that the cook stove uses (NG=natural gas, LP=liquid propane, BU=Butane)Make of Stove: Note the manufacturer of the cook stove.
4. Carbon monoxide tests:
   a. Oven: Record the pre- and post-weatherization "as measured" CO readings under the columns titled "CO." Record the pre- and post-weatherization "air free" CO readings under the columns titled "CF," which matches the indication on the Bacharach PCA 55.
   b. Burners: Record the pre- and post-weatherization "as measured" CO readings for each burner.
5. Vented Range Hood Present? Circle "Yes" or "No" to indicate if kitchen exhaust fans that vents to the outside (not just a recirculating fan) is installed over the cook stove.
6. Flex Connector Type: Indicate the type of flexible connector pipe that is used to supply gas to the cook stove (SS=stainless steel). If the existing connector is brass, it MUST be replaced with a stainless steel or epoxy-coated brass connector.

Unvented Space Heaters (Page 4)

1. Loc: Indicate the location of the unvented space heater.
2. Make: Note the manufacturer of the unit.
3. Model #: Record the model number of the unvented space heater, not the serial number.
4. BTU Input: Record the BTU input (in BTU/hour) from the nameplate.
5. Ventable: Circle "Yes" or "No" to indicate the presence of a removable plate that will expose an exhaust hole that will enable the existing unvented space heater to be vented.
6. CO: Record the results of the carbon monoxide test (in parts per million, ppm).
7. Primary or Secondary: Circle one to indicate of the unvented space heater is the primary heat source, or a secondary source of heat.
8. Gas Shutoff: Circle "Yes" or "No" to indicate the presence of a gas shutoff valve.
9. Gas Leak: Circle "Yes" or "No" to indicate the presence of a gas leak as determined by a gas sniffer. If the gas sniffer confirms a gas leak, note the exact location of the leak so that it can be fixed.
10. Comments: Make notes about which units will be repaired, removed, replaced, or vented.

Water Heater Inspection (Page 5)

Note: The numbers below correspond to the numbers on page 3 of the Home Energy Assessment Checklist.

1. Pass/Fail: Circle "Pass" or "Fail" to indicate the results of the safety tests conducted on the water heater. If the water heater fails, indicate why (e.g., high CO, tank corroded and leaking, etc.). Circle "Repair" or "Replace" to indicate if existing water heater will be repaired or replaced with a new unit. If the unit is to be replaced, indicate the type and size of the replacement water heater.
2. Location: Indicate the location of the existing water heater. Type of Fuel: Circle the type of fuel that the water heater uses (Natural=natural gas).
3. Make: Note the manufacturer of the unit. Model: Record the model number of the water heater. Serial #: Record the serial number of the water heater.
4. Rated BTU Input: Record the rated BTU input (in BTU/hour) from the nameplate. Size: Indicate the size of the water heater tank in gallons. Measured Temperature: Record the hot water temperature in degrees Fahrenheit as measured at a convenient faucet.
5. Gas Leaks? Circle "Yes" or "No" to indicate the presence of a gas leak as determined by a gas sniffer. If the gas sniffer confirms a gas leak, note the exact location of the leak so that it can be fixed.
6. If Natural Gas (Clock Meter): Indicate which "Dial" (in cubic feet) on the gas meter was clocked. Record how many seconds it tool for the dial to make one full revolution. From the "Carl's Calibration & Repair" card provided during training, look up the BTU per hour for the dial clock and time for one revolution. Circle "Yes" or "No" to indicate if the clocked BTU/hour is within 10% of the rated BTU/hour from the nameplate.
7. Six Yes/No questions:
   a. Can Water Heater be Insulated? Circle "Yes" or "No" to indicate there is adequate clearance to wrap the water heater with an insulation blanket.

b. Can Insulate First 5 feet of Hot/Cold Water Line? Circle "Yes" or "No" to indicate there is adequate clearance to install pipe insulation on the first 5 feet of the hot and cold water line. On gas water heaters, the vent may not allow sufficient clearance for the safe installation of pipe insulation.
c. Is Pressure Relief Piping Needed? Circle "Yes" or "No" to indicate if piping is needed at the outlet of the pressure and temperature relief valve. If the valve pops, hot water could scald occupants and damage the house if no discharge piping has been installed on the P&T valve outlet to direct the discharge down close to the floor where it can flow down a nearby drain.
d. Is There Evidence of Flame Roll Out? Circle "Yes" or "No" to indicate the presence of scorch marks near gas burner access plate.
e. Is Pilot Safety Shutoff OK? Circle "Yes" or "No" to indicate if the gas valve closes if the pilot flame goes out.

8. Is Main Vent/Chimney OK? Circle "Yes" or "No" to indicate if the water heater vent or chimney complies with applicable codes. If "No," circle all of the choices below that apply. The questions listed for each choice are single examples; there may be other situations that warrant circling that particular choice. If the reason for "No" is not listed below, specify reason in blank provided.
   a. Type: Is single-wall vent used in unconditioned space?
   b. Location: Is water heater and vent located in a bedroom?
   c. Clearance: Is vent too close to combustible materials like drywall, studs, or joists?
   d. Height: Is vent outlet within 10 feet of roof peak, but less than 2 feet taller than roof peak?
   e. Size: Has vent diameter been reduced in violation of code?
   f. Cap: Does vent terminate with an appropriate vent cap?
   g. Liner: Does water heater vent to an unlined brick chimney?
   h. Mortar: Is mortar in brick chimney deteriorated?
   i. Flashing: Are there signs of water leakage around inadequate or missing chimney flashing?
   j. Unused flue holes: Does water heater vent to a chimney with open, unused flue holes?
   k. Thimble: Does water heater vent through a wall without an approved thimble (collar)?
   - Chimney Type, Size, Height: Indicate type (e.g., brick), size (e.g., 9 inches square, 9 inches by 12 inches), and height (in feet) of chimney.
   - Liner: Circle "Existing" or "Needed" to indicate the presence of an existing chimney liner. Specify the type, size, and height of existing liner or the type, size, and height of liner needed.
9. Is Vent Connector from Water Heater to Chimney OK? Circle "Yes" or "No" to indicate if the vent connector from water heater to the chimney complies with applicable codes. If "No," circle all of the choices below that apply. The questions listed for each choice are single examples; there may be other situations that warrant circling that particular choice. If the reason for "No" is not listed below, specify reason in blank provided.
   a. Proper type pipe: Is single-wall vent used in unconditioned space?
   b. Connected properly: Are vent pipe sections secured with sheet metal screws or are snap connectors securely fastened?
   c. Leaky or corroded: Is vent pipe corroded or otherwise leaky?
   d. ¼" rise per ft: Is vent inclined at least ¼ inch vertically for every foot of horizontal run? Any condensate inside the vent should flow back toward the water heater.
   e. Excessive elbows: Does vent have more than two elbows? One elbow has as much resistance to air flow as 20 feet of straight vent pipe.
   f. Clearance: Is vent connector too close to combustible materials like drywall, studs, or joists?
   - Vent Connector Type, Size, and Run: Indicate vent connector type (e.g., single-wall, B vent), size (inches in diameter), and run (length in feet to chimney).
10. Is Combustion Air Venting Needed? Circle "Yes" or "No" to indicate of additional venting is needed to bring combustion air to water heater. The water heater closet or mechanical room must be at least 50 cubic feet in volume for every 1000 BTU/hour of rated input or combustion air venting must be added. For example, a 30,000 BTU/hour water heater would need at least 1500 cubic feet (30,000/1000x50) of open space, which is equal to a room measuring 10 feet by 9 feet with an 8-foot ceiling.
11. BTU/hour allowed in existing water heater closet: Measure the length (L), width (W), and height (H) of the water heater closet or mechanical room in feet. Multiply L x W x H to determine the cubic foot volume of the water heater closet. Divide volume by 50 to determine the allowed BTU/hour rating allowed in thousands of BTU/hour. Record answer in space provided.

12. Sq" of NFA Combustion Air Needed: Specify the BTU/hour input rating of the water heater. Divide input rating by 1000. Multiply result by 2 to determine the square inches of net free area (NFA) needed for water heater combustion air. Record answer in space provided.
13. Vent Size for NFA Needed (High): Enter the width (W) and height (H) in inches of a grill that will fit high on the water heater closet door or wall. Multiply W x H x 0.75 to determine the net free area (NFA) of the specified grill. This should equal at least half of the value computed in step 12 above. If not, specify a larger grill and repeat the W x H x 0.75 calculation.
14. Vent Size for NFA Needed (Low): Enter the width (W) and height (H) in inches of a grill that will fit low on the water heater closet door or wall. Multiply W x H x 0.75 to determine the net free area (NFA) of the specified grill. This should equal at least half of the value computed in step 12 above. If not, specify a larger grill and repeat the W x H x 0.75 calculation.

Diagnostic Inspection of Water Heater (Page 4)

Note: The numbers below correspond to the numbers on page 3 of the Home Energy Assessment Checklist.

15. For pre- and post-weatherization tests, complete combustion appliance zone (CAZ) sheet on page 5 and recreate worst case. Record worst case pressure in CAZ (with reference to outside) in the space provided.
16. Draft (Worst Case): Record pre- and post-weatherization draft in the water heater vent under WORST CASE conditions in either inches of water column (WC) or Pascals (Pa).
17. CO Living Area: Measure and record carbon monoxide level in the living area under NORMAL conditions.
18. CO Flue Gases: Measure the carbon monoxide level in the water heater vent under NORMAL conditions. Record the "as measured" value indicated by "CO" on the Bacharach PCA 55 display. The as measured CO should be less than 100 parts per million (ppm).
19. CO Flue Gases (Air Free): Measure the carbon monoxide level in the water heater vent under NORMAL conditions. Record the "air free" value indicated by "CF" on the Bacharach PCA 55 display. The air free CO should be less than 400 parts per million (ppm).
20. Stack Temperature (each port): On both sides of the baffle, measure and record the stack temperature of the water heater indicated by "TS" on the Bacharach PCA 55 display.
21. Oxygen Percentage (each port): On both sides of the baffle, measure and record the percentage of oxygen in the water heater flue gases indicated by "O2"on the Bacharach PCA 55 display.
22. Efficiency Percentage (each port): On both sides of the baffle, measure and record the percentage efficiency of the water heater indicated by "EF" on the Bacharach PCA 55 display.

Comments: Note any important observations regarding the water heater.

Heating Unit Safety Inspection (Page 6)

Note: The numbers below correspond to the numbers on page 4 of the Home Energy Assessment Checklist.

1. Pass/Fail: Circle "Pass" or "Fail" to indicate the results of the safety tests conducted on the heating system. If the heating system fails, indicate why (e.g., high CO, corroded heat exchanger, etc.). Circle "Repair" or "Replace" to indicate if existing heating system will be repaired or replaced with a new unit. If the unit is to be replaced, indicate the type and size of the replacement heating system.
2. Location: Indicate the location of the existing heating system. Type of Fuel: Circle the type of fuel that the water heater uses (Natural=natural gas, Elec=electric). Type of Unit: Inducate type of heating system (FA=forced-air furnace, VSH=vented space heater, USH=unvented space heater, G=gravity furnace).
3. Make: Note the manufacturer of the unit. Model: Record the model number of the heating system. Serial #: Record the serial number of the heating system.
4. Rated BTU Input: Record the rated BTU input (in BTU/hour) from the nameplate. Rated BTU Output: Record the rated BTU output (in BTU/hour) from the nameplate. If Natural Gas (Clock Meter): Clock meter with heating system firing using procedures described in step 6. of the Water Heater Inspection instructions above. Circle "Yes" or "No" to indicate if the clocked BTU/hour is within 10% of the rated BTU/hour from the nameplate.
5. Thermostat Location: Indicate location of thermostat that controls the heating system. Mercury? Circle "Yes" or "No" to indicate if the thermostat uses a mercury switch. Temp Day/Night: Enter the daytime and nighttime thermostat set points. Anticipator Setting: Specify the anticipator setting, which is visible when the thermostat cover is removed.

6. Gas Leaks? Circle "Yes" or "No" to indicate the presence of a gas leak as determined by a gas sniffer. If the gas sniffer confirms a gas leak, note the exact location of the leak so that it can be fixed.
7. Four Yes/No questions and two fill-in-the-blank questions:
   a. Is Heating Unit on Separate Circuit? Circle "Yes" or "No" to indicate if heating unit is supplied with electricity by a dedicated circuit that serves no other loads.
   b. Is There an Electrical Disconnect? Circle "Yes" or "No" to indicate the presence of a disconnect to shut off electrical power to the heating unit. A circuit breaker in the main electrical panel does not count as a disconnect.
   c. Are There Any Burned Wires? Circle "Yes" or "No" to indicate the presence of scorch marks on wire insulation that may indicate previous electrical overloads.
   d. Circuit Breaker/Fuse Size at Service Panel: Indicate the amp rating of the circuit breaker or fuse serving the heating unit from the service panel.
   e. Circuit Breaker/Fuse Size at Disconnect: Indicate the amp rating of the circuit breaker or fuse that is part of the electrical disconnect.
   f. Visual Inspection of Safety Controls? Circle "Yes" or "No" to indicate if safeties seem to be in place and that there are no loose, disconnected, or jumped wiring (e.g. Door Switch). If appliance is gas and has a standing pilot light, you may want to blow out pilot to make sure safety stops flow of gas to pilot light. You should hear a soft click within about 45 seconds when gas flow shuts off.
8. Filter Information
   a. Location: Indicate the location of the air filter protecting the heating system (e.g., return duct at unit, return grill in hall).
   b. Type: Indicate type of furnace filter (e.g., disposable fiberglass filter, disposable pleated filer, cleanable/reusable filer).
   c. Not installed: Check space if no furnace filter was found.
   d. Clean/Dirty: Check the appropriate space to indicate the cleanliness of the existing furnace filter.
   e. Cleaned and Replaced: Check space if the reusable filter was cleaned and replaced.
   f. Filter Size: Specify the length and width (in inches) of the filter.
   g. Qty: Indicate how many filters will be needed to replace the existing filter and leave extras with the client.
   h. Does Blower Need Cleaning? Circle "Yes" or "No" to indicate of the blower requires cleaning.
   i. Noisy? Circle "Yes" or "No" to indicate if the blower is excessively noisy, which may indicate that the blower motor bearings are worn out and the motor needs replacing.
9. Is Main Vent/Chimney OK? Circle "Yes" or "No" to indicate if the heating system vent or chimney complies with applicable codes. If "No," circle all of the choices below that apply. The questions listed for each choice are single examples; there may be other situations that warrant circling that particular choice. If the reason for "No" is not listed below, specify reason in blank provided.
   a. Type: Is single-wall vent used in unconditioned space?
   b. Location: Is heating unit and vent located in a bedroom or other inappropriate area?
   c. Clearance: Is vent too close to combustible materials like drywall, studs, or joists?
   d. Height: Is vent outlet within 10 feet of roof peak, but less than 2 feet taller than roof peak?
   e. Size: Has vent diameter been reduced in violation of code?
   f. Cap: Does vent terminate with an appropriate vent cap?
   g. Liner: Does heating unit vent to an unlined brick chimney?
   h. Mortar: Is mortar in brick chimney deteriorated?
   i. Flashing: Are there signs of water leakage around inadequate or missing chimney flashing?
   j. Unused flue holes: Does unit vent to a chimney with open, unused flue holes?
   k. Thimble: Does heating unit vent through a wall without an approved thimble (collar)?
   - Chimney Type, Size, Height: Indicate type (e.g., brick), size (e.g., 9 inches square, 9 inches by 12 inches), and height (in feet) of chimney.
   - Liner: Circle "Existing" or "Needed" to indicate the presence of an existing chimney liner. Specify the type, size, and height of existing liner or the type, size, and height of liner needed.
10. Is Vent Connector from Water Heater to Chimney OK? Circle "Yes" or "No" to indicate if the vent connector from heating unit to the chimney complies with applicable codes. If "No," circle all of the choices below that apply. The questions listed for each choice are single examples; there may be other situations that warrant circling that particular choice. If the reason for "No" is not listed below, specify reason in blank provided.
    a. Proper type pipe: Is single-wall vent used in unconditioned space?

b. Connected properly: Are vent pipe sections secured with sheet metal screws or are snap connectors securely fastened?
c. Leaky or corroded: Is vent pipe corroded or otherwise leaky?
d. ¼" rise per ft: Is vent inclined at least ¼ inch vertically for every foot of horizontal run? Any condensate inside the vent should flow back toward the heating system.
e. Excessive elbows: Does vent have more than two elbows? One elbow has as much resistance to air flow as 20 feet of straight vent pipe.
f. Clearance: Is vent connector too close to combustible materials like drywall, studs, or joists?

- Vent Connector Type: Indicate vent connector type (e.g., single-wall, B vent), size (inches in diameter), and run (length in feet to chimney).

11. Is Clearance from Heating Unit to Combustibles OK? Circle "Yes" or "No" to indicate if clearances comply with code. If "No," circle building surface (ceiling, walls, or floor) that is too close to heating unit.
12. Is Heat Exchanger OK? Circle "Yes" or "No" to indicate if the heat exchanger is free from leaks and excessive corrosion.
13. Is This Unit Sealed Combustion? Circle "Yes" or "No" to indicate if the heating unit draws combustion air directly from outside and exhausts combustion gases with a fan (no draft diverter present).
14. Is Combustion Air Venting Needed? Circle "Yes" or "No" to indicate of additional venting is needed to bring combustion air to water heater. The combustion appliance zone (CAZ) must be at least 50 cubic feet in volume for every 1000 BTU/hour of rated input or combustion air venting must be added. For example, an 80,000 BTU/hour furnace would need at least 4000 cubic feet (80,000/1000x50) of open space, which is equal to a room measuring 25 feet by 20 feet with an 8-foot ceiling.
15. If "Yes," How Many Sq Inches Needed: Follow instruction steps 12 through 14 under Water Heater Inspection to calculate the net free area of combustion air venting required for the heating system.

Diagnostic Inspection of Heating System (Page 6)

Note: The numbers below correspond to the numbers on page 3 of the Home Energy Assessment Checklist.

16. For pre- and post-weatherization tests, complete combustion appliance zone (CAZ) sheet on page 5 and recreate worst case. Record worst case pressure in CAZ (with reference to outside) in the space provided.
17. Draft Inducer and Pressure Switch: Circle "Yes" or "No" to indicate if draft inducer functions properly. Switch Pass: Circle "Yes" or "No" to indicate if the pressure switch tests OK.
18. Draft (Worst Case): Record pre- and post-weatherization draft in the water heater vent under WORST CASE conditions in either inches of water column (Wc) or Pascals (Pa).
19. CO Living Area: Measure and record carbon monoxide level in the living area under NORMAL conditions.
20. CO Flue Gases: Measure the carbon monoxide level in the water heater vent under NORMAL conditions. Record the "as measured" value indicated by "CO" on the Bacharach PCA 55 display. The as measured CO should be less than 100 parts per million (ppm).
21. CO Flue Gases (Air Free): Measure the carbon monoxide level in the water heater vent under NORMAL conditions. Record the "air free" value indicated by "CF" on the Bacharach PCA 55 display. The air free CO should be less than 400 parts per million (ppm).
22. Stack Temperature (each port): On both sides of the baffle, measure and record the stack temperature of the water heater indicated by "TS" on the Bacharach PCA 55 display.
23. Oxygen Percentage (each port): On both sides of the baffle, measure and record the percentage of oxygen in the water heater flue gases indicated by "O2"on the Bacharach PCA 55 display.
24. Efficiency Percentage (each port): On both sides of the baffle, measure and record the percentage efficiency of the water heater indicated by "EF" on the Bacharach PCA 55 display.
25. Heat Rise: Measure and record the supply and return air temperature when the heating unit is firing. Compute and record the heat rise across the heat exchanger (supply temperature minus the return temperature).
26. Comments: Note any important observations regarding the heating system.

Fireplace Information (Page 6)

1. Vented Fireplace? Circle "Yes" or "No" to indicate if fireplace vents to the outside.

2. Location: Specify the location of the fireplace.
3. How Often Used? Note the number of times a month the fireplace is typically used.
4. Damper? Circle "Open," "Closed," or None" to indicate the presence and condition of the fireplace damper.
5. Operable? Circle "Yes" or "No" to indicate if the fireplace damper can be opened and closed.
6. Seal Off If Not Used? If fireplace is not used, circle "Yes" or "No" to indicate if customer agrees to seal off fireplace to reduce air infiltration.

Combustion Appliance Zone (CAZ) Test Set-Up (Page 6)

1. Primary/Secondary/Water Heater: Check appropriate space to indicate which combustion appliance is being tested.
2. Check and Clean Lint Filter and Dryer Vent: Check after the dryer lint filter and dryer vent have been cleaned.
3. Replace or Clean Furnace Filer If Needed: Check after the furnace filter has been replaced or cleaned as needed.
4. Put House in Wintertime Condition: Check after all exterior doors and windows have been closed and all interior doors have been opened.
5. Turn Off All Combustion Appliances: Check after verifying that all combustion appliances have been turned off and prevented from coming on during CAZ test (e.g., by turning down heating thermostat).
6. Close All Operable Vents and Dampers: Check after verifying that all operable vents to the outside such as chimney dampers are closed.

Combustion Appliance Zone Test Steps (Page 7)

COMBUSTION APPLIANCE ZONE TESTING:

How do we do Combustion Appliance Zone Testing?:

Place combustion appliances on PILOT.
Setup for natural conditions and measured baseline pressure differential
Measure the Base Pressure.
Start with all exterior doors, windows, and fireplace damper(s) closed.
Set all combustion appliances to the pilot setting or turn off the service disconnect, including: boiler, furnace, space- heaters, and water heater.
With the home in this configuration, measure and record the base pressure of the combustion appliance zone with reference to outside.
Record Pressure _____ Pascals

Created worst case conditions
Establish the Worst Case.
Turn on all fans in home — bath fans, exhaust hood and air handler
Make sure all exterior doors are closed
Ensure the damper to fireplace is closed
Close interior doors (unless there is a fan behind it), check pressure now.
Close bedroom door, recheck pressure to see if it became more negative
Record most negative Pressure_____Pascals

Correctly measured worst-case CAZ Depressurization
Natural Pressure:_____
Worst Case Pressure:_____
Difference_____(remember it is the distance it takes to get from natural to worst and is a negative number) Use the difference on the table below:
You want your difference to be less negative than the number on the table (i.e. if limit is -2 then your number should be
> -2)

CAZ Depressurization Limits

You want your difference to be less negative than the number on the table (i.e. if limit is -2 then your number should be >-2)

to cool between tests. IF IT STILL FAILS THEN A SERVICE MUST BE PERFORMED.

Performed worst case draft test

Measure Worst Case Draft. Test the draft in the flue/connector 1-2' after the diverter or first elbow.

Measure the pressure in the Combustion Appliance Zone with reference to the pressure inside the flue.

What if the pressure reading?

What is temperature outside?

Acceptable Draft Test Ranges

Outside Temperature (degree F)	Minimum Draft Pressure Standard (Pa)
<10	-2.5
10-90	(T-out/40)-2.75
>90	-0.5

Reading on manometer_____Pascals — reading should be more negative than table above.

If it is 80 degrees outside then: 80/40 = 2 and 2 — 2.75 = -.75

The pressure on the manometer should be <-.75

If measured draft is below minimum draft pressures, investigate the reason for the weak draft. Open a window or door to observe whether the addition of combustion air will improve draft. If this added air strengthens draft, the problem usually is depressurization. If opening a window has no effect, inspect the chimney. The chimney could be blocked or excessively leaky Repeat the above steps for each combustion appliance from smallest BTU to largest.

If the appliances are vented together then you will test each one individually at first then test both appliances together to verify one is not affecting the other.

Is that the final test?

No, now we need to test for Worst Case CO.

Measure Worst-Case CO. Test for CO at the flue at steady state (if steady-state is not achieved within 10 minutes, take CO readings at the 10 minute mark). Test for CO in ALL appliances in the flue, before the draft diverter in undiluted flue gasses

Carbon Monoxide Tests CO shall be measured of undiluted flue gases, in the throat or flue of the appliance using a digital gauge and measured in parts per million (ppm).

Dominant Duct Leakage Test (Main Body WRT Outdoors) (Page 8)

1. Set up the digital manometer according to the *Dominant Duct Leak Test* section of the laminated card. With the air handler off, measure and record the baseline pressure of the main body of the house (e.g., living room or family room open to hallway) WRT outdoors.
2. Turn on air handler. Turn on the furnace blower at the thermostat by moving the fan switch from Auto to On. If there is no fan switch, adjust the thermostat to call for heat. Record the pressure of the main body of the house WRT outdoors. If pressure is negative or less than the baseline pressure, the leaks in the supply ducts are larger than those in the return ducts. In other words, supply duct leaks are dominant. If the pressure is positive or greater than the baseline pressure, the leaks in the return ducts are larger than those in the supply ducts, or return duct leaks are dominant.

Room Pressure Testing (Room WRT Outdoors). No Room Should be More Than -/+ 3Pa WRT Outside (Page 5)

1. With air handler running, record the pressure of individual rooms WRT outdoors. The form has columns multiple tests: before and after weatherization, as well as an interim reading during weatherization. No room should be more than +/- 3 Pa WRT outdoors. Rooms exceeding +3 Pa WRT outdoors may need additional return air by undercutting doors or installing a jumper duct. Rooms exceeding –3 Pa WRT outdoors may need additional supply air.

Window Air Conditioner(s) (Page 6)

1. For each window air conditioner in the house, record the:
   a. Location: Indicate the room the window unit serves (e.g., family room, back bedroom, etc.).

b. Name: Record the brand name of the window air conditioner.
c. BTU: From the nameplate, record the BTU/hour output rating of the window unit. The front cover of the unit may need to be unclipped or unscrewed to gain access to the nameplate.
d. EER: From the nameplate, record the Energy Efficiency Rating (EER) of the window unit. If the EER is not listed on the nameplate, record the year that the window unit was manufactured, if listed, because you can estimate the efficiency of the unit from the Federal energy efficiency standard that was in effect when the equipment was made.
e. Perm: Ask the occupant if the window unit is removed from the window in the winter and re-installed in the spring. If the window unit is left in place year round, specify "Yes" to indicate that the window unit is permanent.
f. Cover: Specify "Yes" or "No" to indicate if an exterior cover is installed on the window unit during the winter months.
g. Filter: Inspect the filter and indicate on the form if it needs to be cleaned. Indicate of the filter is no longer present.
h. Coils: Inspect the inside and outside coils and indicate on the form if they needs to be cleaned. The unit should usually be removed from the window and the coils cleaned outside.
i. Comments: Record any observations that require further action during weatherization.

Central Air Conditioners/Heat Pumps (Page 8)

1. Outdoor Loc: Indicate where the outdoor unit is located (e.g. behind house, east side of house).
2. Name: Indicate the brand name of the outside unit.
3. Model: From the nameplate, record the model number of the outside unit.
4. Serial: From the nameplate, record the model number of the outside unit.
5. If the output rating is not specifically listed on the nameplate, check the model number and look for numbers that are multiples of 6 or 12. Each ton of refrigeration equals 12,000 Btu/hour. So, a model number containing a 36 is most likely rated for 3 tons (12 thousand Btu/hour/ton x 3 tons = 36 thousand Btu/hour). Similarly, a model number containing 42 will typically be rated at 3½ tons (42 ÷ 12 = 3.5).
6. SEER: From the nameplate, record the Seasonal Energy Efficiency Rating (SEER). If the SEER is not listed on the nameplate, record the year that the outside unit was manufactured, if listed, because you can estimate the efficiency of the unit from the Federal energy efficiency standard that was in effect when the equipment was made.
7. Disconnect: Specify "Yes" or "No" to indicate the presence of a disconnect to shut off electrical power to the outdoor unit. A circuit breaker in the main electrical panel does not count as a disconnect.
8. Suction Line Insulation: Specify "Yes" or "No" to indicate if the suction refrigerant line is insulated. The suction line is the one with the larger diameter.
9. Coil: Indicate of the outdoor coil is dirty and requires cleaning.
10. Indoor Loc: Indicate where the indoor unit is located (e.g. basement, mechanical closet).
11. Name: Indicate the brand name of the inside unit.
12. Model: From the nameplate, record the model number of the inside unit.
13. Serial: From the nameplate, record the model number of the inside unit.
14. KW: For heat pumps, record the kW rating of the auxiliary, or strip, heaters from the nameplate.
15. X: Multiply the kW rating by 3412 to determine the heating capacity of the strip heaters in units of Btu/hours.
16. Btu Input: From the nameplate, record the Btu input rating of the indoor coil
17. Coil: Indicate of the indoor coil is dirty and requires cleaning.
18. Thermostat Location: Indicate where the thermostat is located (e.g., hall, exterior wall in family room).
19. Mercury? Circle "Yes" or "No" to indicate if the thermostat contains a mercury switch.
20. Temp Day: Specify the temperature to which the thermostat is typically set during the day.
21. Temp Night: Specify the temperature to which the thermostat is typically set at night.
22. Filter Location: Indicate the location of the air filter protecting the central air conditioner (e.g., return duct at unit, return grill in hall). Type: Indicate type of air conditioner filter (e.g., disposable fiberglass filter, disposable pleated filer, cleanable/reusable filer).
23. Not installed: Check space if no filter was found.
24. Clean/Dirty: Check the appropriate space to indicate the cleanliness of the existing air conditioner filter.

25. Cleaned and Replaced: Check space if the reusable filter was cleaned and replaced.
26. Filter Size: Specify the length and width (in inches) of the filter.
27. Qty: Indicate how many filters will be needed to replace the existing filter and leave extras with the client.
28. Does Blower Need Cleaning? Circle "Yes" or "No" to indicate of the blower requires cleaning.
29. Noisy? Circle "Yes" or "No" to indicate if the blower is excessively noisy, which may indicate that the blower motor bearings are worn out and the motor needs replacing.
30. Comments: Record any observations that require further action during weatherization.

Ducts/Heating Pipes (Page 9)

1. Duct Location: Indicate the location of ducts or heating pipes (e.g., attic, crawl space).
2. Cond/Uncond: Specify "Cond" or "Uncond" to indicate if ducts or heating pipes are in conditioned or unconditioned space.
3. Boots: Visually inspect boots (connections between duct and registers). Check (✓) if the boots are in good condition. If the boots require repair, mark the field with an "X" and specify in the comment section which boots need repair/replacement. Remember that all boots should be sealed even if they are in good condition.
4. Registers: Visually inspect the registers and check (✓) if they are clean and in good condition. If the registers require cleaning or replacement, mark the field with an "X" and specify in the comment section which registers need attention. If the dwelling is a mobile home, all registers will generally be replaced, so list the size and quantity of registers needed (e.g., 7 @ 4"x10") .
5. Supp Duct: Visually inspect the supply ducts and check (✓) if they are in good condition. If the supply ducts require repair, reconnection, and/or sealing, mark the field with an "X" and specify in the comment section if specifics are needed.
6. Ret Duct: Visually inspect the return ducts and check (✓) if they are in good condition. If the return ducts require repair, reconnection, and/or sealing, mark the field with an "X" and specify in the comment section where the return ducts need repair or replacement
7. Supp Plenum: Visually inspect the supply plenum and check (✓) if it is in good condition. If the supply plenum require repair and/or sealing, mark the field with an "X" and specify in the comment section where the supply plenum ducts need repair or replacement.
8. Crossover: The crossover connects the two duct systems in a double-wide mobile home. Visually inspect the crossover and check (✓) if it is in good condition. If the crossover requires repair, reconnection, and/or sealing, mark the field with an "X" and specify in the comment section where the crossover needs ducts need repair or replacement.
9. Duct Wrap: Visually inspect the insulation installed on ducts or heating pipes in unconditioned areas. Check (✓) if the duct/pipe insulation is present and in good condition. If no duct/pipe insulation exists or is in poor condition, mark the field with an "X" and specify in the comment section where the duct/pipe insulation needs to be added or replaced and how many square feet of duct are uninsulated.
10. Ft Insul: If duct or heating pipes running through unconditioned areas require insulation, indicate the number of linear feet of duct/pipe need insulation.
11. Comments: See 3 through 10 above for what type of comments will assist in preparations to weatherize the house.
12. Type Ductwork: Circle the appropriate choice to indicate the presence of sheet metal, flex duct, ductboard, or other type of ductwork.
13. Type Duct System: Circle the appropriate choice to indicate the type of duct system. A "trunk" duct system has a main trunk duct that runs down the length of the house with branch duct tapping off the trunk to the individual registers. A "spider" system has a central supply plenum with many flex ducts tapping off the plenum to the individual registers. A "cottage base" system is a down-flow furnace that sits on a sheet metal supply plenum that has registers cut into the plenum or may have short supply runs. This system acts more like a space heater than a ducted system. If not listed, specify the type of duct system in the space provided.
14. Supply Size: Measure and record the width and depth (or diameter) of the supply plenum (if present) and all supply ducts. Circle "Yes" or "No" to indicate if the supply plenum and supply ducts are adequately sized.

    To determine if the supply ducts are adequately sized, use the slide-rule-type *Air Duct Calculator* that was provided during training. Base the total required air flow that the air handler must move on the capacity of the furnace and/or air conditioner. Air flow of a furnace should to be 400 cubic feet per

minute (CFM) for every 25,000 BTU/hour of furnace output. Similarly, an air conditioner should have 400 CFM for every 12,000 BTU/hour (1 ton) of output. Therefore, for a house with a central air conditioner rated at 36,000 BTU/hour (3 tons), 1,200 CFM of air flow is needed for the air conditioner to operate properly.

Assume that for this example the supply plenum measures 16 inches by 12 inches. In the middle window of the *Air Duct Calculator*, connect the lines between numbers on the top and bottom scales and read the CFM air flow in the top window that lines up with the recommended residential duct friction setting of .10 per 100 feet of duct. Connecting 16 on the top scale with 12 on the bottom scale indicates that the plenum is adequately size since it can deliver 1,250 CFM, which is more than the minimum required 1,200 CFM.

Now assume that eight flexible supply ducts connect the plenum to registers throughout the house. Slide the scale in the window labeled "Round Duct Diameter (in.)" so that the 6-inch diameter lines up with the arrow. Reading the top window, each 6-inch flex duct can deliver about 108 CFM at the recommended residential friction setting. This means that eight 6-inch flex ducts can deliver 864 CFM (108 x 8). Since 864 CFM is less than the minimum required 1,200 CFM, additional supply ducts should be added to this system for it to operate properly.

Return Size: Measure and record the width and depth (or diameter) of the return plenum at its smallest point. For example, a return system may have a 14"x16" register connected to a return duct running in a stud cavity that measures 14"x3½". Record the smaller dimension. Circle "Yes" or "No" to indicate if the return plenum and return ducts are adequately sized. Use the *Air Duct Calculator* and the procedures described above to determine proper sizing of the return system. For return systems, use a friction setting of .08 per 100 feet instead of .10. For the previous example that required 1200 CFM of air flow, line up 1200 CFM with a friction setting of .08 on the top scale. Reading the middle scale, the smallest point in the return system must measure at least 10"x20", 12"x17", or combinations that line up.

15. Replace Return Grill with Filter Grill: Circle "Yes" or "No" to indicate if the existing return grill should be replaced in order to provide the capability to filter air moving through the heating system.

Blower Door Diagnostics (Page 9-10)

1. Location: Indicate in which door the blower door was installed for both the pre- and post-weatherization blower door tests.
2. Configuration: Circle "Open," "Ring A," or "Ring B" to indicate if any rings were installed in the blower door during the pre- and post-weatherization tests.
3. Baseline: With the blower door fan off, record the baseline pressure difference of the house with respect to outside for both the pre- and post-weatherization blower door tests. The baseline pressure will be added to the pressure difference during the blower door test to ensure a 50 Pa pressure difference between the house and outside. For example, the baseline pressure difference between the house and outside is +3 Pa. During the blower door test, we want the pressure of the house with respect to outside to be –50 Pa (we're sucking air out of the house so the pressure difference is negative). Since -50 + 3 = -47, adjust the fan speed during the blower door test to –47 Pa.
4. PA: Record the pressure difference of the house with respect to outside taking into account the baseline pressure.
5. CFM: Record the CFM indicated on the digital manometer with the dial set to "Flow."
6. CRF: If a 50 PA pressure difference could not be achieved during the blower door test, enter the "Can't Reach Fifty" factor corresponding to the actual pressure difference from the table.
7. Converted CFM: If a 50 Pa pressure difference could not be achieved, multiply the measured CFM by the "Can't Reach Fifty" factor and record the result.

Zonal Pressures (Page 10)

1. Zone Tested: Zones that are commonly tested for zonal pressures are pre-printed on the form. There are also blank rows for the assessor to specify the location of other zones tested.
2. Before/WRT House: With the blower door running before sealing bypasses and other air leaks, record the pressure difference of the zone with respect to the main body of the house.

3. Before/WRT Outside: With the blower door running before sealing bypasses and other air leaks, record the pressure difference of the zone with respect to outside.
4. After/WRT House: With the blower door running after sealing bypasses and other air leaks, record the pressure difference of the zone with respect to the main body of the house.
5. After/WRT Outside: With the blower door running after sealing bypasses and other air leaks, record the pressure difference of the zone with respect to the outside.
6. Comments: Record any observations that require further action during weatherization.

Pressure Pan Test (Page 10)

1. House WRT Duct Location, Before/After: With the blower door running, record the pressure difference of the house with respect to where the ducts are located (e.g., attic, basement, crawl space) before and after sealing the ducts.
2. Location: Record the location of every register (e.g., master bedroom, family room).
3. Before: With the blower door running, record the pressure difference of the duct register with respect to the house before sealing the ducts.
4. After: With the blower door running, record the pressure difference of the duct register with respect to the house after sealing the ducts.
5. Return: With the blower door running, record the pressure difference of the return register with respect to the house before and after sealing the ducts.
6. Pressure Pan Multipliers: If the pressure of the house with respect to outside with the blower door running is less than 50Pa during either the before or after test, use the multipliers in the table to convert measured pressure pan values to actual values.

Attic Weatherization (Page 11)

1. Insulation (Bags Needed): Based on the existing and proposed R-values and the attic area, estimate the number of bags of insulation needed to insulate attic. Base this estimate on the coverage charts on the insulation bags.
   a. Dimensions: For each different attic area (Attic 1, 2, and 3), enter the dimensions in feet.
   b. Square Footage: From the dimensions, compute the square foot area of each different attic area.
   c. Existing Type: Indicate the type of existing attic insulation, if any.
   d. Existing R-Value: Record the R-value of the existing attic insulation. The R-value of existing loose-fill cellulose insulation is about 3.13 to 3.7 per inch of thickness. If the existing cellulose insulation is less than 3 inches thick, use 3.7 per inch. If the existing cellulose insulation is 6 inches thick or more, use 3.13 per inch. The R-value per inch of other types of insulation also varies with thickness. See the table below for the R-value of various thicknesses of loose-fill and batt insulation

Loose-fill fiberglass, rock, or slag	R-Value	Fiberglass, rock, or slag batts or blankets	R-Value
3.75 to 5 inches	11	3 to 4 inches	11
6.5 to 8.75 inches	19	3.5 inches	13
7.5 to 10 inches	22	5.5 to 6.5 inches	19
10.25 to 13.75 inches	30	6 to 7.5 inches	22
		9 to 10 inches	30
		12 to 13 inches	38

   e. Added Type: Indicate the type of attic insulation to be added, if any.
   f. Post-Weatherization R-Value: Indicate the final R-value after insulation is added, if any.
2. Condition of Attic:
   a. Water Leaks: Indicate if there are signs of past or present water leaks in the different attic areas.
   b. Recessed Lights: Indicate if any recessed lighting fixtures are installed in the different attic areas that penetrate the ceiling. If the recessed lighting fixtures are not "IC" rated, baffles or shields will need to be installed to keep attic insulation at least 3 inches from the fixtures.
   c. Chimney/Vent Shielding: Indicate if shielding needs to be installed to keep attic insulation from touching chimneys or combustion appliance vents.
   d. Condition of Wiring: Indicate if the wiring in the attic is in good condition or if the wire insulation is brittle, cracked, or missing. Indicate if there are any open connections or splices that require that installation of junction boxes. Indicate the presence of live knob-and-tube wiring that will need to be replaced or blocked before attic insulation can be added.

e. Attic Access: Indicate the location and size of existing access to the different attic areas. If an attic access needs to be added, indicate where the access should be location and what size it should be.

3. By-Passes:
   a. Open Exterior Wall Tops: Circle "Yes" or "No" to indicate if the tops of the exterior walls are open to the attic and need to be sealed.
   b. Open Interior Wall Tops: Circle "Yes" or "No" to indicate if the tops of the interior walls are open to the attic and need to be sealed.
   c. Wire, Plumbing, HVAC Chases: Specify any wire, plumbing, and HVAC chases that represent air by-passes.
   d. Stairwell, Closet, Soffit Drops: Specify any stairwells, closets, or soffit drops that represent air by-passes.
4. Ventilation:
   a. Net Free Ventilation Area (NFVA) Square Inches (Sq ") Needed: Calculate the total net free ventilation area needed by multiplying the attic area in square feet by .24. To induce attic ventilation, half of the total net free ventilation area must be located high in the attic (such as ridge or gable vent) and half of the NFVA must be located low in the attic (such as soffit vents). Air is drawn in through the low vents and exhausted through the high vents.
   b. Sq" Existing Exhaust (High): Record the net free ventilation area of existing exhaust vents located high in the attic. Remember that the NFVA of a finned vent cover is often only half of the gross area of the opening.
   c. Sq" Needed Exhaust (High): Take half of the total NFVA needed calculated in step a. above and subtract the existing exhaust (high) NFVA to determine any additional exhaust NFVA that is needed. A difference of zero or less indicates that no additional exhaust NFVA is required.
   d. Total NFVA Exhaust Sq": Add the existing and needed exhaust NFVA.
   e. Sq" Existing Intake (Low): Record the net free ventilation area of existing intake vents located low in the attic. Remember that the NFVA of a finned vent cover is often only half of the gross area of the opening.
   f. Sq" Needed Exhaust (Low): Take half of the total NFVA needed calculated in step a. above and subtract the existing intake (low) NFVA to determine any additional intake NFVA that is needed. A difference of zero or less indicates that no additional intake NFVA is required.
   g. Total NFVA Intake Sq": Add the existing and needed intake NFVA.
   h. Add the total NFVA exhaust and intake computed in steps d. and g. above. The sum should equal or exceed the total NFVA needed calculated in step a above.

Sidewalls (Page 12)

1. Existing Insulation?: Indicate the R-value of existing wall insulation, if any. Columns for two different types of wall construction are provided.
2. Knob-and-Tube Wiring?: Circle "Yes" or "No" to indicate if the walls contain live knob-and-tube wiring.
3. Are Walls Weak?: Indicate if the interior drywall/paneling or exterior sheathing/siding flexes easily when pressed.
4. Can Sidewalls Be Blown?: In light of any signs of weakness or other obstacles, indicate if sidewalls can be dense-packed with cellulose insulation.
5. Type of Interior Walls?: Indicate the type of interior wall finish (e.g., drywall, paneling).
6. Type of Exterior Walls?: Indicate the type of exterior wall finish (e.g., vinyl siding over tar board, wood clapboard).
7. Type of Framing?: Circle "Balloon" or "Stick" to indicate the type of wall framing. Balloon-framed walls do not have a top plate. The wall cavities are open to the attic and open between floors.
8. Width of Cavity?: Circle 24" or 16" to indicate how far apart the wall studs are spaced. If not 24" or 16", indicate the width of the wall cavities.
9. Depth of Cavity?: Circle "2x4" or "2x6" to indicate the type of wall studs. If not "2x4" or "2x6", indicate the depth of the wall cavities.
10. Exterior Wall Surface?: Measure the length and height of all above-ground wall sections and record the gross surface area in square feet. For a typical one-story house, the gross wall area would be the perimeter of the house multiplied by the ceiling height.
11. Less Windows/Doors?: From page 10, add up the square foot area of all windows and doors.

12. Net Sq Ft Wall Surface?: Subtract the square foot area of all windows and doors from the gross exterior wall area computed in step 10. above.
13. Total Bags Needed: Using the coverage chart on the insulation bag compute the number of bags of cellulose needed to fill the walls. Some insulation may be wasted during the blow. Also, some coverage charts assume the wall cavities will merely be filled with insulation instead of densely packed. For these reasons, add 15% to make sure enough insulation is brought to the work site.
14. Comments: Record any observations that will affect the installation of additional sidewall insulation.

Crawlspace (Page 12)

1. Type of Foundation: Circle "Crawl" or "Pier" to indicate the type of foundation. Columns for two types of foundations are provided.
2. Type of Sub-Floor: Circle "Plywood," "T&G," or "Plank" to indicate the type of sub-floor. "T&G" stand for tongue and groove.
3. Total Square Ft of Floor: Indicate the total square foot area of the floor.
4. Avg Wall Height Above Grade: Indicate the average height of the foundation wall that is above ground level.
5. Linear Feet of Perimeter: Indicate the length in feet of the perimeter of the foundation (i.e., measure around the outside of the house at the foundation).
6. Vapor Barrier Existing: Circle "Yes" or "No" to indicate if the ground in the crawl space is covered with a vapor barrier (e.g., plastic sheeting, Visqueen®, poly).
7. Open Exterior or Interior Walls: Indicate if any exterior or interior wall cavities are open at the bottom to the crawlspace.
8. Wire, Plumbing, HVAC Chases: Specify any wire, plumbing, and HVAC chases that represent air by-passes.
9. Floor Joist Size 2x: Circle the appropriate number to indicate if the floor joists are 2x6, 2x8, 2x10, or 2x12.
10. Floor Insulation Existing: Circle "Yes" or "No" to indicate the presence of existing floor insulation.
11. R-Value Existing: Specify the R-value of the existing floor insulation, if any.
12. Floor Insulation Needed: Circle "Yes" or "No" to indicate if floor insulation should be added.
13. R-Value Needed: Indicate the R-value of the floor insulation that is needed. Check the *Priority List for Single-Family Homes* tech brief for recommended levels of floor insulation.
14. Exposed Water Lines Wrapped: Circle "Yes" or "No" to indicate if exposed water lines on the crawlspace are wrapped with insulation to prevent freezing. If not, specify the length of water line that must be wrapped.
15. Comments: Record any observations that will affect potential weatherization work in the crawlspace.

Windows (Page 13)

Window information is typically recorded by starting in the front of the house and numbering the left-most window #1, and working to the right around the house.

1. Pass: Check (Y) if the window does not need to be replaced.
2. Type: Indicate the type of window frame (e.g., wood, aluminum).
3. Size: Record the width and height of each window. Unless the window needs to be replaced, measurements to the nearest inch are adequate.
4. Location: Indicate location of window (e.g., kitchen, bedroom #1, family room). Windows may also be shown on the floor plan (page 11) and identified with corresponding numbers.
5. Glass: Indicate if window glass is single or double pane. Indicate if any glass is broken and needs to be replaced. If so, indicate the size of pane that needs to be cut.
6. Lock: Indicate if window locks need to be installed or replaced.
7. Clips: For mobile homes, indicate if window clips are needed to reduce infiltration.
8. Comments: Record any observations that will affect potential weatherization work on the windows.

Doors (Page 113)

1. Doors: Enter information for the main entry door (front) and any other exterior doors (back, side). Indicate width and height in Doors column or in Comments so area can be subtracted from gross wall area to estimate the number of bags of sidewall insulation that will be needed (see page 9).
2. Operation: Indicate if the door opens easily and closes tightly.
3. W/S: Indicate if weather stripping is needed to reduce infiltration and improve comfort. See the legend for handy abbreviations.

4. D/S: Indicate if the requires a door sweep to reduce infiltration and improve comfort.
5. Lockset: Indicate if the lockset needs to be replaced for security and to maintain an air-tight closure.
6. Hinges: Indicate if the hinges have been pulled out of the door or jamb and need to repaired or replaced.
7. Glass: Indicate if glass panels, if any, are broken and need to be replaced. Indicate size of glass that needs to be cut.
8. Comments: Record any observations that will affect potential weatherization work on the doors.

House Footprint (Page 11)

Draw the house footprint (floor plan as viewed from above) in the space provided. Record dimensions. Note locations of windows and exterior doors. Also, note location of any obstructions or construction details that might complicate insulation or air sealing work.

Mobile Home Insulation (Page 12)

1. Total Bags Needed: Based on attic area and level of insulation to be added that is documented below, estimate the number of bags of insulation needed to insulation attic. Use the coverage chart on the insulation bags to be used.
2. Cathedral Sq Ft: Indicate the square foot area of cathedral ceiling.
3. Flat Sq Ft: Indicate the square foot area of flat ceiling.
4. Total Square Footage: Add the square foot areas of cathedral and flat ceiling to compute the total attic area.
5. Peak Height: Indicate the peak height of the attic cavity, which is the distance from the highest point of the roof to the ceiling. It is usually easiest to measure the peak height from the outside of the short wall of the mobile home, taking into account the thickness of the roofing and ceiling materials.
6. Existing Type: Indicate the existing type of attic insulation, if any.
7. Existing R-Value: Record the R-value of the existing attic insulation. The R-value per inch of insulation varies with thickness. See the table below for the R-value of various thicknesses of loose-fill and batt insulation

Loose-fill fiberglass, rock, or slag	R-Value	Fiberglass, rock, or slag batts or blankets	R-Value
3.75 to 5 inches	11	3 to 4 inches	11
6.5 to 8.75 inches	19	3.5 inches	13
7.5 to 10 inches	22	5.5 to 6.5 inches	19
10.25 to 13.75 inches	30	6 to 7.5 inches	22
		9 to 10 inches	30
		12 to 13 inches	38

8. Added Type: Indicate the type of attic insulation to be added, if any.
9. Post-Weatherization R-Value: Indicate the final R-value after insulation is added, if any.
10. Type of Roof: Circle "Shingle," "Metal," or "Other" to indicate the type of roofing material covering the mobile home.
11. Slope of Roof: Circle "A Frame" or "Bow-truss" to indicate the type roof rook slope/pitch.
12. Roof Blowing Access: Circle "Side," "Top," or "Gable" to indicate the access to the attic cavity through which insulation will be blown.
13. Gutter Length: Indicate the length of new gutter to be installed on the mobile home.
14. Roof Coating: Indicate the number of gallons of roof coating that will be applied, if any.
15. Peal and Seal: Indicate the number of sheets or rolls of Peal and Seal® that will be needed to repair roof after adding attic insulation.
16. Plumbing Vent Caps: Indicate the number and size of vent caps required to keep all plumbing penetration watertight.
17. Comments: Record any observations that will affect insulating the attic.

Belly board (Page 12)

1. Repair Needed: Circle "Yes" or "No" to indicate the belly needs repair. Columns for two types of belly construction are provided.
2. Direction of Joists: Circle "Long ways" if the floor joists run the length of the mobile home (parallel to the I-beams). Circle "Crossways" if the floor joists run the width of the mobile home (perpendicular to the I-beams).

3. Depth of Joists: Circle "2x4" or "2x6" to indicate the depth of the floor joists.
4. Vapor Barrier Present: Circle "Yes" or "No" to indicate the presence of a vapor barrier under the mobile home.
5. Exposed Water Lines Wrapped: Circle "Yes" or "No" to indicate if exposed water lines on the crawlspace are wrapped with insulation to prevent freezing. If not, specify the length of water line that must be wrapped.
6. Plumbing Leaks: Circle "Yes" or "No" to indicate the presence of plumbing leaks that need repair.
7. Square Feet Floor: Specify the square foot area of the mobile home floor.
8. Total Bags Needed: Based on floor area and the depth of the joists and the belly, estimate the number of bags of insulation needed to insulation the belly. Use the coverage chart on the insulation bags to be used.
9. Comments: Record any observations that will affect insulating the belly.

Base-Load Measures (Page 13)
Information regarding the refrigerator, lighting, and the water heater are recorded on this page to help determine which electric base-load measures are appropriate.

Refrigerator Assessment and Replacement (Page 13)
1. Brand Name: Specify the brand name of the refrigerator
2. Model #: Record the model number from the nameplate (not the serial number).
3. Type: Circle "Side by Side," "Top Freezer," or "Bottom Freezer" to indicate the freezer configuration.
4. Total Cu Ft: Indicate the total (combined) cubic foot volume of the freezer and fresh food compartment from the nameplate.
5. Door Hinge: Circle "Left" or "Right" to indicate on which side of the refrigerator the hinges are located.
6. Dimensions: Specify the width, depth, and height of the refrigerator in inches.
7. Narrowest Sized Door: Indicate the width of the most narrow door that a new refrigerator will have to fit through during delivery.
8. Metering kWh: From the plug load meter, enter the results of the 2-hour refrigerator metering. Record the kWh consumed, the metering duration in minutes, and the peak Watts. If the peak Watts exceeds about 390 Watts the defrost heaters came on during the test and the results will not be accurate. In this case, try to find the model number on one of the refrigerator energy use databases (NEAT, www.waptac.org, www.homeenergy.org).
9. kWh per year: Assuming the peak Watts during the metering was less than 390 Watts, use the equation to estimate the annual energy use of the refrigerator. The equation simplifies to
   (kWh metered/time metered in minutes) x 567648 = kWh per year
10. Other Refrigerators and Freezers: Indicate the number of additional refrigerators and freezers are in the home. Circle "Yes" or "No" to indicate of the homeowner is willing to allow the additional units to be removed if they receive a new refrigerator/freezer combination unit.
11. Comments: Record any observations that will affect replacing the existing refrigerator.

Lighting Assessment and Replacement (Page 13)
For each lighting fixture that is regularly used over 1 hour per day, record the following information.
1. Room: Indicate where the lighting fixture is located.
2. Existing Incandescent Wattage: Indicate the total (combined) Wattage of all incandescent bulbs in the lighting fixture.
3. Replacement CFL Wattage: Using the lumen table, select the CFL lamp that will maintain or somewhat improve existing lighting levels. Record the Wattage of the CFL selected.
4. Type Fixture: Circle the appropriate choice to indicate the type of lighting fixture. "Tbl" stands for table lamp, "Flr" means a floor lamp, "Ceil" is a ceiling-mounted fixture, and "Wall" is a wall sconce.
5. Type of Bulb Needed: Circle the type of CFL lamp needed to replace the existing incandescent bulb. A "Quad" CFL has four fluorescent U-tubes that allows the CFL to be as bright as a much longer standard CFL that has only two U-tubes. A "Spiral" CFL is another space-saving configuration that is self explanatory and easily identified. "Circ" denotes a Circuline® lamp. Note that some Circuline® lamps require special lighting fixtures and are not a direct replacement for a screw-in incandescent. "Torch" means a torchiere-type lamp found specific kinds of floor fixtures.
6. Comments: Record any observations that will affect potential lighting retrofits.