


**2009 NATIONAL WEATHERIZATION TRAINING CONFERENCE**  
 JULY 20-23, 2009 | INDIANAPOLIS, INDIANA

**Principles of Effective Desktop Auditing**  
 Arizona Energy Office




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**Weatherization-What is Our Goal?**

- Insulating attics?
- Sealing windows?
- Replacing refrigerators?

**Cost effectively reducing the energy burden of our clients.**




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**How We Do This**

- Make the technical measures cost effective.
  - i.e. Duct Sealing, Infiltration, Insulation, etc.
- Keep cost within Industry Standards
- Audit and verify data and technical measures
- Keep process simple!
- The job will be cost effective.




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### THE PROCESS

```

    graph TD
      A[Sub-grantee Performs Audit/ Work] --> B[Data is Entered into Database]
      B --> C[Data is Submitted to Energy Office]
      C --> D[Data is Reviewed by Energy Office]
      D --> E[Energy Office Formally Audits/ Responds to Sub-grantee]
  
```

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### Reporting

- Web database
  - We review 100% of desktop job reports.
- Field monitoring
  - Minimum of 20% of jobs
  - Based on reporting, do additional training when needed.
- Our database is a technical reporting tool, not a financial management program.

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### How? - [www.azwap.org](http://www.azwap.org)

- Web database (started 7/1/05)– Data is collected on our web reporting system.
- All program participants can access data.
  - There are security protocols that limit agency and contractor access to only their jobs.
  - Once a job is completed, data can only be changed by Energy Office.

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**What information is collected-**

- Where you started (house as found).
- What you did (measures installed).
- What it cost.
- What you saved (utility/energy use data).

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**WEB Reporting**

- Demographics (name, address, occupants, income, utility accounts #)
- House characteristics (as found)
- Diagnostics reports (pressure and CO)
- Work completed/cost

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**THE DATABASE**



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Home Page

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Code Tables

- Shows all available code options
- Allows extraction of data for producing reports

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Code Tables

Code	Description	
1001	1 to 5	[icon]
1002	16 to 59	[icon]
1003	6 to 17	[icon]
1004	50+	[icon]

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## Security



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## Security

- Can create access limits for all users
- Each agency can create access limits for contractors
- Utility companies can have access to view how funds are used
- Provides contact information for all agencies

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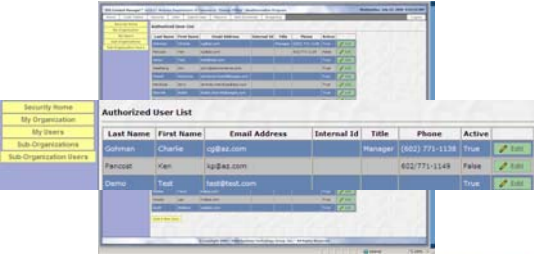
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## Security



Security Name	Authorized User List						
My Organization	Last Name	First Name	Email Address	Internal Id	Title	Phone	Active
Sub-Organization	Gorman	Charlie	cg@ec.com		Manager	(862) 775-1138	True
Sub-Organization Users	Parsons	Ken	kp@ec.com			602-775-1149	False
	Ortiz	Tyrell	tor@ec.com				True

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## Security

The screenshot shows a web form for entering organization information. The fields are as follows:

Organization Name:	Arizona Department of Commerce
Organization Nickname:	Energy Office
Organization Type:	Headquarters Organization
Organization Department:	Contractor
Organization Division:	Funding Source
Organization Address:	1700 W. Washington Street, Ste 200
Organization City:	Phoenix
Organization State:	Arizona
Organization Zip Code:	85007
Organization Phone:	(602) 771-1119
Organization Fax:	(602) 771-1203



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## Jobs



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## Jobs

- Sub-grantee enters data on jobs that are in progress
- Data can be changed until job is submitted
- For sub-grantee and contractor use only



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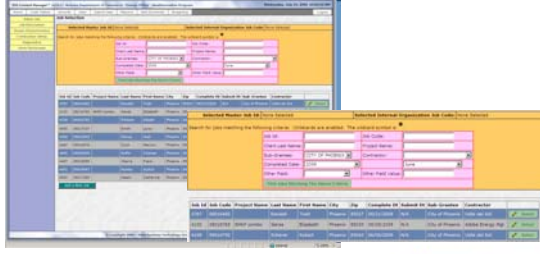
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### Jobs



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### Submitted Data

- Same layout as Jobs page
- Desktop audits performed from these pages
- For Energy Office use

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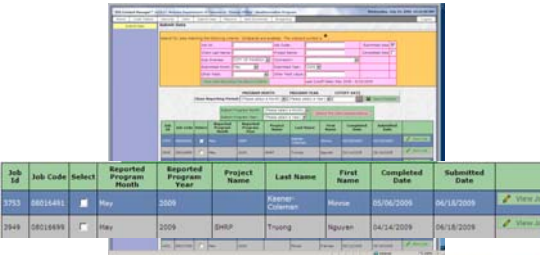
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### Submitted Data



Job ID	Job Code	Select	Reported Program Month	Reported Program Year	Project Name	Last Name	First Name	Completed Date	Submitted Date
3783	08016493	<input checked="" type="checkbox"/>	May	2009	Kilmer, Coleman	Nguyen	05/06/2009	06/18/2009	<a href="#">View Job</a>
2949	08016899	<input checked="" type="checkbox"/>	May	2009	SWP	Truong, Nguyen	04/24/2009	06/18/2009	<a href="#">View Job</a>

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### Job Information

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### Job Information

- Client Information
  - Client address
  - Income
  - House occupancy
  - Utility provider and account numbers
  - Work timelines
  - ARRA Funding (New)

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WTC Content Manager™ v3.0.2.1 - Indiana Department of Commerce - Energy Office - Weatherization Program

Monday, July 20, 2009 10:50:08 AM

Job Form (Add/Edit/Delete Mode)

Master Job ID: 1001      Inferred Organization Sub Code: 111111

Job Code: 111111      Auditor/Program: ARRA [Yes]      App. Intake Date: 7/20/2009

Sub-Grantee: 1001      Walk Away Job:       Job Completed Date: 7/20/2009

Contractor:      Final Inspection By:      Submitted Date: 9/25/2008

Client Information

Project Name: 100101      Last Name: 1234      First Name: 1234

Street Address 8: 1234 56      Address 81:      City:      State:      Zip Code: 11111

Yearly Household Income: \$14,432.00       Rented       Owned

House Occupancy

Occupant	Age Group	Notes
1	[10+]	To check Occupant above check here: <input type="checkbox"/>
2	[10-19]	To check Occupant above check here: <input type="checkbox"/>
3	[10-19]	To check Occupant above check here: <input type="checkbox"/>

Utility Provider

ELECTRIC: 1234      ACCOUNT NUMBER: 111111111111

GAS: Southwest Gas      ACCOUNT NUMBER: 222222222222

OTHER:      ACCOUNT NUMBER:      POVERTY LEVEL: 100%

Comments:

WTC Content Manager™ v3.0.2.1 - Indiana Department of Commerce - Energy Office - Weatherization Program

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## House Characteristics



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## House Characteristics

- Provide information on the home as found.
  - Type
  - Age
  - Sq. ft.
  - Envelope features
  - HVAC

It is important that this information is complete and accurate.

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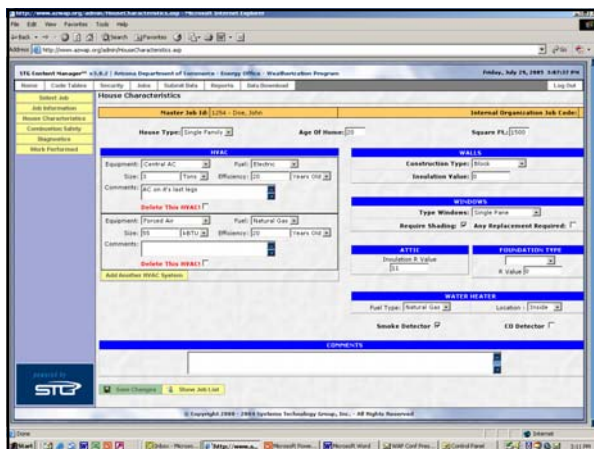
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### Combustion Safety



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### Combustion Safety

- Records all of the relevant data on combustion appliances in the house, possible health and safety issues with these appliances and the actions taken by the Weatherization program.
- Because combustion appliances can be the dominant factor in the health and safety of the occupants, it is imperative that the combustion safety procedures are followed in all cases.

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**NO EXCEPTIONS**

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## Pressure Diagnostics



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## Pressure Diagnostics

- Records the relevant data on the airflow characteristics of a home and the resulting changes in these characteristics achieved by the Weatherization program.
- Because airflow is a dominant factor in the health and safety of the occupants and the energy efficiency of a home, it is imperative that the pressure diagnostic procedures are followed in all cases.

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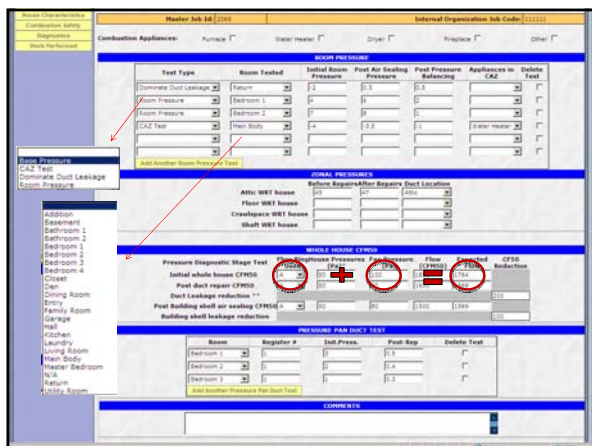
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Master Job ID: 1008      Internal Organization Job Code: 11111

Combustion Appliances: Furnace  Water heater  Dryer  Fireplace  Other

Test Type	Room Tested	Initial Room Pressure	Post Air Sealing Pressure	Post Pressure Balancing	Appliance in Use	Delete Test
Dominate Duct Leakage	Basement	0.1	0.1	0.1		
Room Pressure	Bedroom 1	0.1	0.1	0.1		
Room Pressure	Bedroom 2	0.1	0.1	0.1		
CO2 Test	Enter Data	0.1	0.1	0.1	Enter Meter	

**FLOOR PRESSURE**

Before Repair	After Repair	Repair Duct Location
0.1	0.1	
0.1	0.1	
0.1	0.1	

**FLOOR PAN DUCT TEST**

Room	Register #	Init. Press.	Post. Press.	Flow (CFM)	Initial CFM Reduction
Bedroom 1	3	0.1	0.1	0.1	
Bedroom 2	3	0.1	0.1	0.1	
Bedroom 3	3	0.1	0.1	0.1	

COMMENTS

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We take duct sealing very seriously



These holes are under a lot of pressure

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**Work Performed**

- What was done?
- How much did it cost?
- Who paid for it?
- Was it cost effective?

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Was This Cost Effective? They have Solar....



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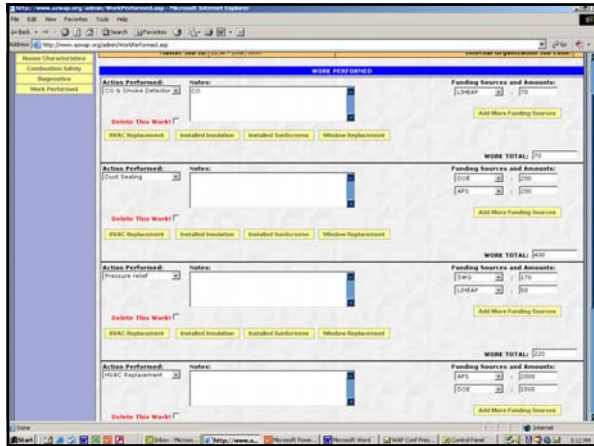
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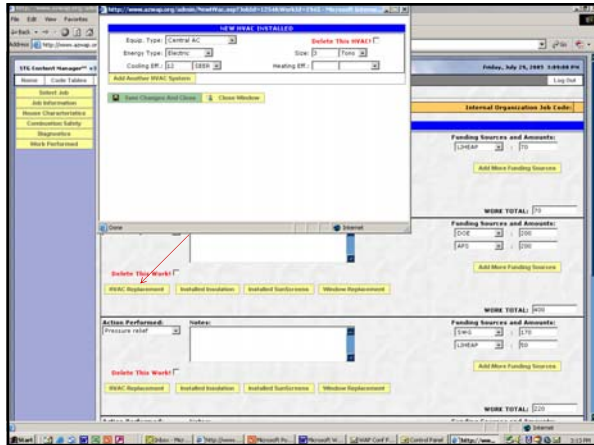
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**50 unit senior housing project**  
**Project cost of \$90,000**  
**New AC units, duct sealing, pressure balancing and attic insulation.**

*Lower away!*  
An air conditioning unit is lowered by crane onto the roof of an apartment as part of a weatherproofing project for low-income housing in Avondale Feb. 21.



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**Utility Data (50 units combined): Work completed in April**

	1999	2000	2001	2002	2003
Jan	1580.9	1650.41	1717.51	1706.64	1576.79
Feb	1441.6	1511.78	1523.79	1483.57	1449.21
Mar	1686.7	1904.13	1680.86	1744.15	1758.57
Apr	2064.6	2702.18	2434.62	2245.56	1756.26
May	3559	4304.16	4379.49	3065.68	3037.52
Jun	5383.4	5472.49	5056.97	4016.33	3491.86
Jul	6484.9	5429.73	5247.87	3860.77	3745.05
Aug	6361.1	6566.62	6050.38	4609.58	4705.3
Sep	5260.1	4952.66	5186.72	3832.81	3838.1
Oct	3050.5	3471.33	3518.97	2644.71	3003.6
Nov	2152.2	1727.36	2135.01	1681.74	2092.98
Dec	1668.7	1727.41	1780.71	1628	1795.61
<b>Tota</b>	<b>40694</b>	<b>41420.26</b>	<b>40712.9</b>	<b>32521.34</b>	<b>32250.9</b>

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**Results- Electric Only**

- Pre WAP average of about \$41,000 per year for 50 units.
- Post WAP average of about \$32,400 per year for 50 units.
- Yearly saving of \$8,600 per year.
- Present value of saving = \$103,000
- SIR of 1.14 on electric savings only.

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**Surprise!**



**Utility Bill**  
**\$8,600.00**  
**Savings per year**

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### Report Types

- Desktop Response
- Field Reports
- Agency
- Contractor
- Work Performed
- Funding Source

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### Desktop Response

- Simple and clear
- Accepted
- Accepted with concern
- Rejected
- Response and corrective action needs to be done in 30 days.

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### Field Report

- Printouts mirror database entries
- Useful for field audits

COMPLETION OF WEATHERIZATION REPORT									
Agency	Case No.	Case Name	Case Status	Case Type	Case Category	Case Sub-Category	Case Priority	Case Date	Case Location
...	...	...	...	...	...	...	...	...	...

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### Funding Source Breakdown by Work Performed

Department of Energy		\$39,137.43
<input type="checkbox"/>	Gila County Division of Health and Community Serv	\$143.00
<input type="checkbox"/>	Maricopa County	\$23,655.70
<input type="checkbox"/>	Foundation for Senior Living (Maricopa)	\$22,116.26
	Audit	\$2,790.00
	Duct Sealing	\$1,109.86
	HSD - Gas & Smoke Detector	\$397.52
	HSD - Boiler Service	\$10,991.28
	HVAC Replacement	\$3,815.00
	HVAC Service	\$1,231.91
	Installed Insulation	\$373.49
	Installed Sunscreens	\$620.28
	Pressure Relief	\$300.00
	Replace Registers	

Extracted to manage 20% allowed by DOE

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### Thank You- Questions?



Arizona- It's a Dry Heat....

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