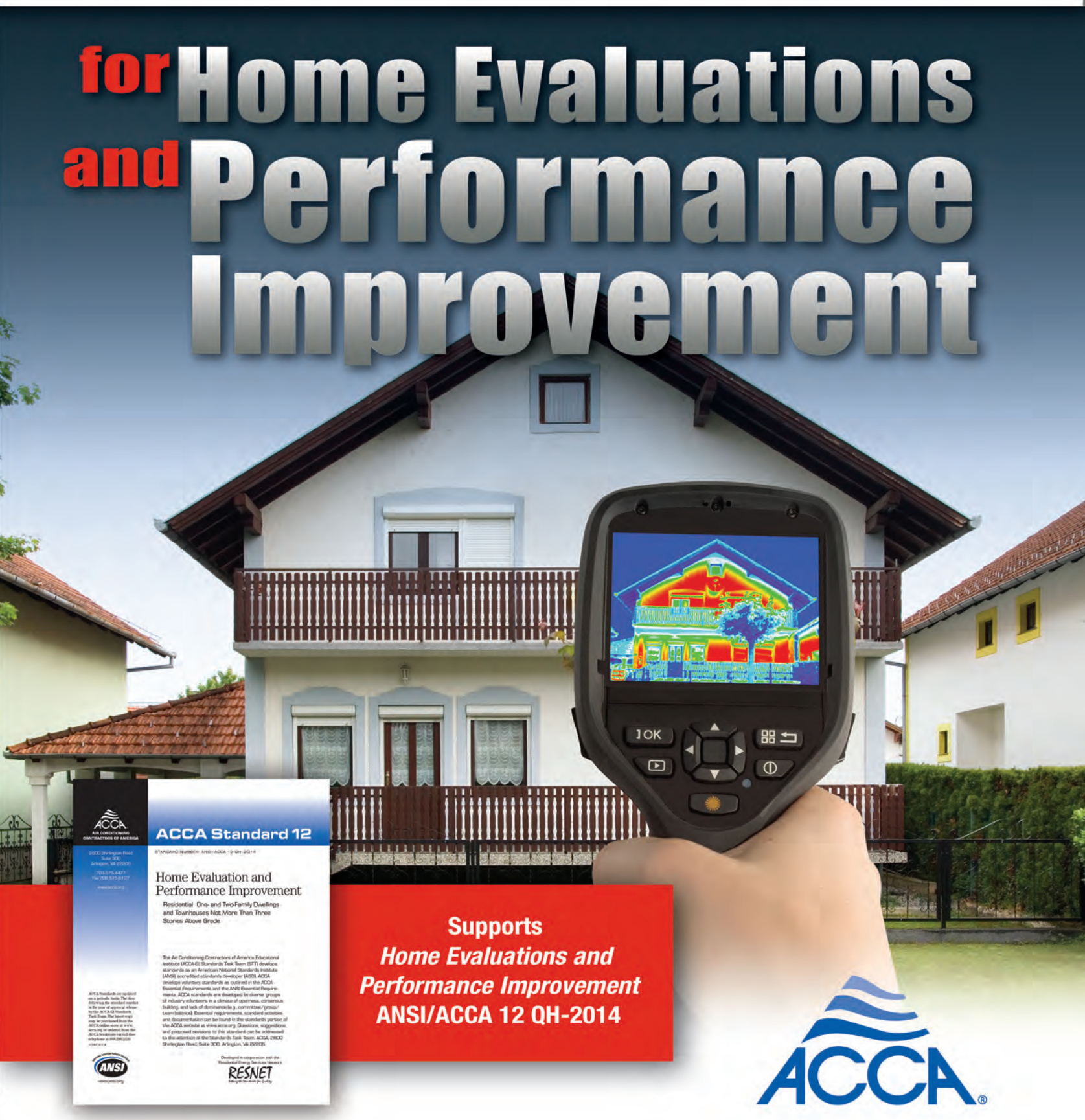
Technician's Guide & Workbook

for Home Evaluations and Performance Improvement



Supports
Home Evaluations and Performance Improvement
ANSI/ACCA 12 QH-2014

ACCA®

TECHNICIAN'S GUIDE & WORKBOOK FOR HOME EVALUATION AND PERFORMANCE IMPROVEMENT

2015

A Compendium to ANSI/ACCA 14 QH-2014
Home Evaluation and Performance Improvement

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Intent

Many ACCA members have built upon their successful reputations as the best available HVAC contractors by becoming the best whole home performance contractors in their local market area. With the 2014 update of the ANSI/ACCA 12 QH-2014 *Home Evaluation and Performance Improvement* (*QH Standard*) a new Technician certification was crafted: a hybrid HVAC Technician capable of understanding whole house energy upgrade opportunities. The *Technician's Guide & Workbook for Home Evaluation and Performance Improvement* is written to be used as the basis for that course and certification program for Technicians. It covers the steps that are necessary for an experienced HVAC Technician to complete and document compliance with all of the requirements outlined in the *QH Standard*.

Most successful Technicians have strong soft skills, and deal well with homeowners. When that ability is added to their ability to properly assess complex problems, and develop solutions they become excellent candidates for leading a *QH Standard* based home performance evaluation. However, the additional paperwork, notes, and measurements required for home performance evaluations are more cumbersome. This is due to the size and scope: QH evaluations cover all of the parts of the home, and how subsystems interact when changed.

This Guide and Workbook provides an approach for organizing and recording needed notes, measurements, and other information. By adhering to guidance in the Guide and Workbook, Technicians will be able to follow a repeatable process for obtaining, selling and overseeing home performance improvements. Finally, there may be items in a home performance audit unique to an individual home. Having the Guide and Workbook as a quick reference in the field will provide Technicians with the resource material needed to complete the required tests, measurements, and documentation for any home.

Two types of training are not covered in this Guide and Workbook: The first has three parts, software for load calculations, equipment selection and duct design and the second has two parts, the software that performs the actual energy audit and the method for evaluating the current energy usage. The first is covered extensively by other ACCA training that is available and the second is covered by auditing training available commercially.

Introduction

The *Technician's Guide & Workbook for Home Evaluation and Performance Improvement* is divided into sections that parallel the material covered in the *QH Standard*. However, the requirement found in the *QH Standard* are expanded upon, and further explained so the Technician can better understand the type of tasks, the tools required, and the procedures needed, to undertake a home performance evaluation project. The workbook was designed for both individual learning and for classroom usage. In the book, at intervals designed to clarify and enhance the training material, are questions (in blue print), with space for answers to be written in by the Technician. These question are designed to reinforce many of the important points covered in the sections. There are also recommended field exercises (in green print) designed for hands on learning. Those who complete the Guide and Workbook will be taking the first steps to becoming field experts trained to provide a safe, healthy, and energy efficient home environment. Technicians who develop the knowledge base required for implementing home performance improvements will be able to address evaluations that include: whole plumbing fixture ratings, electrical loads, and envelope properties as well as the related HVAC system requirements.

The Guide & Workbook does not provide training on any one of the home auditing/evaluation software tools that are available on the market. Technicians will need to also get training on the usage of the auditing software selected by the contractor they work for in order to complete a home performance audit. Once this Guide & Workbook are completed, along with the auditing/evaluation training; a skilled Technician with the appropriate tools and manufacturer's manuals can complete a home evaluation and home performance audit. By following the instructions provided and obtaining the data and measurements, that process will become verifiable and repeatable.

Additionally, it should be noted that the *QH Standard's* design requirements (sizing, duct design, and HVAC equipment selection and installation) are covered briefly in the Guide & Workbook, with focus on the required documentation. ACCA has established manuals to aid for the required facets of design: Manual J®, Manual D®, Manual S®, Manual RS®, Manual T®, and *Technician's Guide & Workbook for Quality Installations*. Those Manuals, or other approved methods for designing and installing, need to be utilized for a HVAC system's installation to be compliant with the ANSI/ACCA 5-2015 *HVAC Quality Installation Specification.* Load calculation, equipment selection and duct design are covered in other ACCA training materials. Thus they will not be repeated in this Guide and Workbook.

To further help Technicians organize and record the information required for a *QH Standard* based home evaluation for performance improvement, there are generic instructions, for approved procedures the Technician needs to complete for each requirement. The Guide and Workbook contains examples and illustrations include various types of building materials, items that need to be documented in the field, building structural types, and testing and diagnostic equipment. This guide & workbook provides a broad perspective on available tools, with emphasis on tools specifically mentioned in the *QH Standard*. Technicians can use this Guide & Workbook to help in the selection of an appropriate measurement instruments for a specific job.

Table of Contents

Technician's Guide & Workbook for Home Evaluation and Performance Improvement

1.0 Purpose (*Reference §1.0 in the QH Standard)*

The ANSI/ACCA 12 QH-2014 *Home Evaluation and Performance Improvement* (*QH Standard*) establishes the minimum criteria by which deficiencies in existing residential buildings are identified during a home audit. Improvement opportunities are assessed, scopes of work are developed and finalized, and then the work is performed in accordance with industry recognized procedures.

2.0 Scope (*Reference §2.0 in the in the QH Standard)*

The *QH Standard* applies to site-constructed, or manufactured, one- and two-family dwellings and townhouses not more than three stories above grade in height (see Figure 1).

Figure 1: One to Three Story Family Residences

3.0 Comprehensive Performance Audit (*Reference §3.0 in the in the QH Standard)*

Comprehensive performance audits collect information about the residence. Measurements, tests, and observations are required to gather information for many areas of the home. This section covers unsafe conditions, and documentation requirements. The *QH Standard* separates required portions of the standard and items that are good to do but not required. Items in the *QH Standard* that are not required are labeled as discretionary items. Often items not required are important to the customer and for doing the best job possible. Thus, in this Guide & Workbook they are included but are identified as discretionary. Subsection in section 3.11 covers discretionary items. To do a complete analysis, Technicians need to consider the option of including discretionary items in their report. Since they represent good practice, and good customer service, as well as additional sales opportunities, they are included along with the mandatory requirements in this Guide & Workbook. Discretionary items are further identified and addressed in the Section 3: Additional Auditing Procedures (page 59)

When specific home performance improvements are requested by the homeowner, or as part of a program sponsoring the home performance contracts, or is required by code for a remodel, or update, the Technician must include the information required to support the design and implementation of those upgrades in the audit report. The Technician's job is to dig below the surface and to evaluate things related to the home's construction and operation.

An important responsibility for every Technician is: upon discovery of any condition deemed unsafe, the Technician shall halt the audit process and leave the building and recommend that the occupants do the same until the situation is resolved.

3.1 INTERVIEW *(Reference: §3.1 in the QH Standard)*

Homeowner interviews are where the first information based on the homeowner's opinion on how their home is operating and what their perceived performance problems are is gathered. Often the owners will think everything is OK and they are only seeking methods for reducing energy consumption.

Requirements

Homeowner interviews need to identify occupant behaviors and use patterns. So it is good to have as many of the adults in the home as possible there for the interview (see Figure 2). The interview process generally should take between 15 and 30 minutes. The homeowners should be notified early in the appointment scheduling process that their participation for that period of time will be required. However, after the interview, the Technician performing the audit needs to make sure those with asthma, allergies, chemical sensitivity, etc., were notified that some of the testing procedures may cause them irritation and they should not be present, and should allow an hour or two to pass after the testing is completed before they reenter the home. The interview is designed to identify things the occupants do that impact energy use, and existing problems or concerns with their homes envelope and mechanical systems.

Once an appointment is scheduled, the Technician should arrive on time, make sure everyone who needs to be involved in the decision making process is present, and then ask the questions and write down the answers taking photographs of problem areas and damage where appropriate (see Figure 3). Thus, it can be an interview on the move as well as at the kitchen table. Use common sense and be sure to write the answers given to the questions legibly so you have a complete record. There are 26 basic must ask questions listed below, along with how the answers may help you to come up with guidance for a home performance plan (answers are shown in *blue italics* below the questions). The questions may lead to additional follow-up questions that will in turn become items that need to be addressed in the proposal. Additionally, your company may have other questions to ask. Bottom line, the more information gathered the better.

Figure 2: Both Homeowners at the Interview

Figure 3: Photo of Water Damage

Basic Interview Questions

General Questions for Data Gathering:

1. Do you own or rent the home? (Note: Renters must have express written permission from the home's owner prior to having an audit performed.)
   This is important because if they do not have ownership, they may not be able to authorize work.
2. How many people live (or work) in your home?
   This becomes a factor for considering things like the heating and cooling load, and/or hot water heater size, etc.