

1 **P6 – Proposed Guidelines for Home Performance with ENERGY STAR® In-field Quality**
2 **Assurance Inspection Protocols**

3
4 Background

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6 The National Home Performance with ENERGY STAR (HPwES) Program believes that
7 providing clear guidance on program quality assurance (QA) requirements is important to local
8 sponsors. Local program sponsors are required to have a QA program that evaluates whether
9 participating contractors have:

- 10 - Performed a Home Performance Assessment¹ to make proper recommendations;
- 11 - Made improvements which will reduce energy use in the home;
- 12 - Performed required diagnostic tests and inspections upon completing the
- 13 improvements; and
- 14 - Satisfied the terms of the home improvement contract with the customer.

15 Local program sponsors' QA programs are required to include in-field inspections of work
16 completed by all participating contractors. The In-field Inspection Protocols presented in this
17 document have been developed to clarify QA requirements for the in-field inspection process.

18
19 There are several QA-related topics that are not addressed in this proposal, but have been
20 either previously proposed, proposed concurrently, or will be proposed after comments are
21 received on this proposal. These topics include:

- 22
- 23 - HPwES quality assurance requirements²
- 24 - Minimum contractor eligibility and participation guidance
- 25 - Job report review guidance and suggested follow-up protocol
- 26 - Customer feedback guidance and suggested follow-up protocol³
- 27 - Contractor feedback and corrective action guidance⁴
- 28

29 Comments Requested

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31 The National HPwES Program is seeking comments on the proposed In-field Inspection
32 Protocols; specifically:

- 33 1. Are the proposed approach and inspection protocols clear and reasonable?
- 34 2. If they are not clear and reasonable, how should they be modified to make them so?
- 35 3. Are there additional in-field inspection protocols that should be addressed, and if so what
- 36 are they?
- 37

38 **In-field Inspection Protocols**

39 Local HPwES program sponsors are responsible for meeting minimum Program Quality
40 Assurance Requirements, which includes randomly inspecting a percentage of jobs completed
41 by participating contractors. This document has been developed to provide guidance to

¹ See P3 – Proposed Guidelines for Home Performance with ENERGY STAR Comprehensive Home Assessment

² See P1 – Proposed Home Performance with ENERGY STAR Quality Assurance Requirements

³ See P8 – Proposed Home Performance with ENERGY STAR Customer Feedback Guidance

⁴ See P7 – Proposed Guidelines for Home Performance with ENERGY STAR Contractor Feedback and Corrective Action

1 programs on meeting the in-field inspection requirement. The protocols for performing in-field
2 inspections have been broken up into the following areas:

- 3
- 4
- 5 1.1 Job Selection Protocol
- 6 1.2 Customer Discussion
- 7 1.3 Visual and Diagnostic Inspection
- 8 1.4 Contractor Scoring Protocol
- 9 1.5 Inspection Documentation
- 10 1.6 Contractor Follow-up⁵
- 11
- 12

13 **1.1 Job Selection Protocol**

14 In-field inspections focus on evaluating contractors on their ability to perform a home
15 performance assessment, develop a scope of work of eligible improvements, and properly
16 install the improvements selected by the customer. It is recommended that program
17 sponsors treat any contractor with multiple offices or locations across wide geographic areas
18 as separate participants for their in-field inspection quality assurance process. In addition, it
19 is recommended that program sponsors develop a process to randomly select jobs
20 completed by each participating contractor for in-field inspection in order to obtain a
21 representative sample. In-field inspections should be made on a continuous basis and not
22 completed in bulk (e.g. Do not wait until a contractor has completed their first 20 jobs to
23 start performing in-field inspections).

24 Job inspections may occur:

- 25
- 26
- 27 - Post Job Completion: All improvements have been installed; the contractor has
28 tested-out and reported the completed job to the program sponsor.
- 29

30 The National HPwES Program requires that local program sponsors perform infield
31 inspections at a minimum sampling rate of 5% on each participating contractor's completed
32 jobs.⁶ It is recommended that a greater sampling rate be applied to contractor's who are new
33 to the program and/or are not fully meeting program requirements. In addition, a customer
34 complaint may necessitate the need for an in-field inspection.

35 The following phased approach to sampling rates on in-field inspections is recommended:

- 36
- 37
- 38 Phase 1 In-field inspection or mentoring on 3 of the first 5 jobs completed by a new
39 contractor participant.
- 40
- 41 Phase 2 After the first 5 jobs are completed, 20% of the next 20 jobs would receive
42 in-field inspections.
- 43
- 44 Phase 3 After completion of their first 25 jobs, the program sponsor would begin
45 inspecting jobs at a lower sampling rate while maintaining an overall rate
46 that is above or equal to 5% of total completed jobs (minimum required
47 sampling rate).

⁵ See P7 – Proposed Guidelines for Home Performance with ENERGY STAR Contractor Feedback and Corrective Action

⁶ See P1 – Proposed Home Performance with ENERGY STAR Quality Assurance Requirements

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2 In this recommended phased approach, a contractor would not be eligible to move to the
3 next phase, or lower sampling rate, until they have shown that they are consistently meeting
4 program requirements and technical standards. For example, a contractor who has
5 completed their first five jobs, but continues to have issues meeting program requirements
6 would not be eligible to move to Phase 2.
7

8 **1.2 Customer Discussion**

9 It is required that the in-field inspection begin with the inspector introducing themselves,
10 their organization affiliation and an overview of the inspection process and why it's important
11 maintain quality. The inspector is required to interview the customer about their experience
12 with their home performance consultant and/or contractor. Key items to verify during the
13 customer interview include:
14

- 15 - Receipt of any program information piece explaining the home performance
16 assessment (HPA) process and what to expect from the program (if required by
17 program);
- 18 - Confirmation that the customer received an HPA report and that the report was
19 comprehensive in terms of its recommendations;
- 20 - Verification of important pre-existing conditions (if appropriate) and installation of
21 contracted measures;
- 22 - Verification of who installed the measures and when;
- 23 - Discussion of the customer's satisfaction with the contractor's assessment, the
24 installation and with the program overall;
- 25 - Inquiry as to whether the customer has utility bill data available, if they were
26 requested by the contractor and, if so, whether they provided them to the
27 contractor; and
- 28 - Verification that the contractor performed diagnostic test(s) before and after
29 installation of measures (e.g. blower door test prior to beginning installation of
30 shell measures and again after they were complete).
31

32 **1.3 Visual Inspections and Diagnostic Tests**

33 After completing the inspection discussion with the customer, the required visual and
34 diagnostic inspection will begin. The visual and diagnostic inspection includes the following:
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- 36 - Visual inspection of exterior (i.e. chimneys, ventilation, roofing, siding, windows,
37 foundation, trim, fascia, and lot grading);
- 38 - Visual inspection of interior (wall, attic, and floor insulation levels, windows,
39 doors, typical air leakage locations, and moisture issues);
- 40 - Mechanical inspection (heating, cooling, and water heating equipment for model
41 number, age, type, fuel, condition, operability, and efficiency rating);
- 42 - Combustion appliance testing (CO ppm of flue gases, spillage and draft test,
43 combustion appliance zone worst case depressurization, ambient CO, gas leak
44 testing, existence and location of CO sensors and smoke detectors);
- 45 - Verify lighting, appliances, and exhaust fans (age, type, efficiency, condition, and
46 proper venting of exhaust fans) ;
- 47 - Conduct diagnostic tests (blower door and same duct and/or air flow tests as
48 were conducted by contractor during course of work or test-out); and
- 49 - Review contract and inspect all installed measures for compliance with contract,
50 proper installation and compliance with applicable technical standards
51

1 Results of these visual and diagnostic inspections should be compared to the
 2 documentation (home performance assessment, recommended improvements, installed
 3 improvements, and test-out data) reported to the program by the contractor to evaluate their
 4 comprehensiveness, accuracy and validity.

5
 6 **1.4 Contractor Scoring Protocol**

7 It is required that the performance of contractors be evaluated as part of the in-field
 8 inspection process. This evaluation is best done with a scoring protocol in order to
 9 appropriately address any changes needed in the in-field inspection rate for that contractor,
 10 document a history of a contractor’s performance, provide contractor feedback, and to
 11 provide an objective basis for contractor sanctions including cautions, reprimand,
 12 suspension or expulsion as appropriate. The scoring methodology should refer to program
 13 requirements and technical standards where appropriate. Program sponsors may develop a
 14 scoring protocol and submit to EPA and DOE as part of their implementation plan.

15
 16 The following is a proposed methodology to use to evaluate a contractor’s work during in-
 17 field inspection or can be used by program sponsors to design their own scoring
 18 methodology. Through this scoring methodology a contractor would receive the lowest
 19 score for which they received a “Yes”. The scoring is on a scale of 0 to 4, with the 0-2
 20 scores in the “Fail” range and 3-4 in the “Pass” range:

21
 22 **Score: 0** - Contractor’s performance does not meet technical standards or program
 23 requirements and the home requires immediate corrective measures:

Infield Inspection Findings	Yes	No
Failures found in combustion safety testing		
Serious and obvious gas leaks found unaddressed		
Measures in contracted scope of work not installed		
Unsafe conditions resulting from installed work and posing an immediate risk to occupants are found		

24 **Score: 1** - Contractor’s performance does not meet technical standards or program
 25 requirements and the home requires corrective measures:

Infield Inspection Findings	Yes	No
Serious moisture issues have gone unaddressed and have not been included in recommendations		
Health and safety issues present, but do not pose an immediate risk to occupants		
Measures were not installed correctly		
Minor gas leaks found unaddressed in both the customer summary report and in completed work		
Customer did not receive home performance assessment report		

26 **Score: 2** - Contractor’s performance meets all combustion safety requirements but several
 27 technical deficiencies were observed:

Infield Inspection Findings	Yes	No
Below standard installation of insulation		
Air sealing work did not address significant pathways for infiltration		
Windows installed did not meet program requirements		
HVAC equipment not installed to manufacturer’s specifications or not operating properly		

Recommended measures on HPA report were not comprehensive; inspection found several cost effective improvements that were not recommended to the customer		
Test-out reporting does not match in-field quality assurance inspection (inaccurate testing results)		

1 **Score: 3** - Contractor’s performance meets all technical standards and program
 2 requirements but some areas of technical performance need improvement:

Infield Inspection Findings	Yes	No
Installed measures did not meet all technical installation standards, but no serious deficiencies and contractor corrected items.		
Some incorrect data gathered and provided to customer but with no significant impacts on the work completed or effectiveness of the job		
Recommendations in customer report are fairly, but not completely comprehensive		

3 **Score: 4** - Contractor’s performance meets all technical standards and program
 4 requirements

Infield Inspection Findings	Yes	No
All technical standards for installation have been met		
Work comprehensive in nature, and high priority items have been installed.		
Recommended and installed measures were consistent with program requirements; any work not performed was done so by customer decision		
Test-out reporting verified to be accurate		

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 6 **1.5 Inspection Documentation**

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 8 Program Sponsors should keep a record of all inspections performed including in-field
 9 quality assurance inspection form(s), and any follow-up actions with the contractor and/or
 10 customer. Program sponsors need to document:

- 11 - In-field inspection data
- 12 - In-field inspection report including contractor performance scoring
- 13 - Contractor counseling documentation
- 14 - Corrective action work-scope
- 15 - Corrective action completion with customer signature

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 17
 18 **1.6 Contractor Follow-up⁷**

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 20 If the deficiencies found require immediate action, the inspector should contact the
 21 contractor immediately and verify the corrective action on-site. If corrective action is
 22 needed, but unrelated to a health or safety issue then the program should document a
 23 discussion with the contractor about the deficiencies. In addition, a work scope of correction
 24 actions and documentation from the contractor, including a customer signature, that the
 25 work scope has been completed should be part of the inspection record.

⁷ See P7 – Proposed Guidelines for Home Performance with ENERGY STAR Contractor Feedback and Corrective Action