Mass Save Program Independent Installation Contractor

Participation Agreement

between

Center for EcoTechnology, INC. ("CET") AND

_____

This Agreement is made on this day of _____, 2020 between Center for EcoTechnology, Inc., hereinafter called CET, with offices located at: 112 Elm Street in Pittsfield, Massachusetts 01201 and , hereinafter called CONTRACTOR, with offices located at:_____

_____,_____.

Recitals:

a. Mass Save is a public/private partnership that was created to help electric and gas utility customers in Massachusetts ("Customers") save money through energy conservation.
b. CET's Green Home Services Division is a Lead Vendor under contract to Berkshire Gas the "Utility", which is a member utility of the Mass Save Program (www.masssave.com). The Program Description is attached as Attachment1.
c. Once a scope of work to improve a home's energy performance is accepted by a Customer, CET obtains a contract from the Customer (each a "Customer Contract") for performance of installation services ("Work").
d. CET assigns to participating contractors, such as CONTRACTOR, contracts to perform Work for Customers as provided herein.
e. CONTRACTOR is willing and able to enter into such contracts and to perform such Work for Customers under the terms and conditions set forth herein.

TERMS AND CONDITIONS

1. Term of Agreement

   This Agreement shall govern all Customer Contracts CET assigns to CONTRACTOR to be the contractor from the date of the full execution of this Agreement through December 31, 2020, unless terminated at an earlier date in the manner specified in Section 12 of this Agreement.

2. Utility Programs
   a. CET is administering the Mass Save Program on behalf of and under contracts with the Utility. As required of CET under those contracts, CONTRACTOR shall comply with the Contractor Background Check Policy attached as Attachment 2 hereto, and as such Policy may be revised by CET and/or the Utilities from time to time.
   b. The CONTRACTOR shall not use the name of CET, the Utility or Mass Save, or any abbreviation thereof for any advertising, promotions, trade

display or other commercial purposes, nor use their logos or any adaptation thereof, without the prior written consent of CET.

3. Relationships of the Parties Under the Mass Save Program
   a. CET reserves the right, but has no obligation to CONTRACTOR, to assign to CONTRACTOR contracts with customers for Work within CONTRACTOR's competency, and to utilize information collected and maintained under the Utilities' Merit Based Work Allocation System ("Merit System") outlined in Attachment 3, as the same may be revised by CET from time to time.
   b. Except in the case of Customer Contract initiated by the Customer in accordance with paragraph 6(b) below, it has no entitlement or right to be assigned any Customer Contract and hereby absolves and exonerates CET from and against any claim or liability for any action or inaction on the part of CET in its assignments under the Merit System.
   c. In the event that CET assigns to CONTRACTOR a Customer Contract, CONTRACTOR shall notify CET, within two (2) business days of the assignment, whether CONTRACTOR:
      I. is electing to opt out of the assignment, but only to the extent permitted under the Merit System then in effect; or
      II. accepts the assignment, in which case CONTRACTOR shall simultaneously notify CET of the scheduled starting date for the Work and commence and diligently prosecute the Work.

      If CONTRACTOR fails to so notify CET within two (2) business days of its election to opt out or its acceptance of the assignment of the Customer Contract as applicable, CONTRACTOR shall be deemed to have rejected the assigned Customer Contract.
   d. With respect to any Customer Contract assigned to and accepted by CONTRACTOR, CONTRACTOR assumes and agrees to perform, satisfy and discharge all obligations of the contractor under such Customer contract and shall defend, indemnify and hold harmless CET, the Utility and others in accordance with paragraph 12 hereof and with respect to the Customer Contract.
   e. The status of CONTRACTOR under this Agreement shall be that of an independent contractor and not that of an agent or employee of CET or of a Utility. CONTRACTOR and its officers, agents, employees, representatives and servants at all times during the term of this Agreement shall neither hold themselves out as, nor claim to be acting in the capacity of, officers, employees, agents, trustees or servants of CET or the Utility nor make any claim, demand or application for any right or privilege applicable to the Utility.
   f. This Agreement is between CET and CONTRACTOR only. This Agreement does not constitute a contract between CONTRACTOR and the Utility. CONTRACTOR will seek payment or other recourse under this Agreement only from CET, but only to the extent of amounts CET received from the Utility under the Mass Save Program. CONTRACTOR shall seek payment for any amounts billable to a Customer under a Customer Contract only from the Customer.

g. CONTRACTOR shall not vary, modify or amend any Customer Contract without the express, advance written consent of CET.
h. CET reserves the right to perform quality control on any or all Work performed, with or without notice to CONTRACTOR, by any means CET may select, including but not limited to accompanying CONTRACTOR to a Customer's location.
i. All accepted contracts must be completed within 60 days of assignment.

4. Location of Work
CONTRACTOR agrees to provide services, in accordance with the terms hereof, in the homes of Customers in accordance with the terms of this Agreement.

5. CONTRACTOR'S Standard of Care
a. CONTRACTOR agrees to perform all Work under any Customer Contractor assumed hereunder in conformity with the standards of the Mass Save program as implemented by CET.
b. CONTRACTOR shall comply with the standards set forth in Attachment 5, *"Mass Save Materials Installation Standards"* and with any and all specifications, manuals, training and product literature supplied from time to time by CET.
c. CONTRACTOR will follow manufacturers' instructions where applicable. If CONTRACTOR becomes aware of any inconsistency between any such manufacturers' instructions and any specifications, manuals, training and product literature supplied by CET, then CONTRACTOR shall promptly notify CET thereof and shall await further instructions from CET before proceeding with Work affected by the inconsistency.
d. CONTRACTOR will maintain high quality standards for the services provided under this Agreement. CONTRACTOR will promptly remedy any substandard Work reported by a Customer or identified by CET. All Work performed for Customers under this Agreement shall be of good quality and shall be carried out in a workmanlike manner, in complete conformity with any applicable requirements of any state, local or national code governing the Work or systems affected by the Work.
e. CONTRACTOR will keep a Customer's home as free as possible from waste materials while performing Work under this Agreement.
f. After completing any Work under a Customer Contract accepted under this Agreement, CONTRACTOR will clean the work area, removing all waste materials, tools and supplies.
g. CONTRACTOR will be careful not to cause damage to a Customer's premises.
h. Failure of CONTRACTOR to meet quality standards will be grounds for termination.

6. Assignment, Scheduling and Completion of Work
a. The Parties will administer Customer Contracts initiated by CET or a person other than CONTRACTOR in accordance with the Program Description in Attachment 1 and this Agreement.

b. Customers may also refer CONTRACTOR to CET for consideration to have a proposed Customer Contract administered in accordance with the Program Description in Attachment 1 and this Agreement. The Customer Referral Process outlined in Attachment 6, as the same may be revised by CET from time to time, shall apply to any such referral.

c. When CONTRACTOR believes all Work under a Customer Contract is complete, CONTRACTOR shall submit to CET a Certificate of Completion with all information supplied and signed by the Customer.

7. Pricing

a. Any work within the scope of a Customer Contract assumed hereunder shall be priced on the basis of the Unit Price for each type of Work stated in Attachment *7*, *"Schedule of Unit Prices."* Pricing for any Work included in a Customer Contract for which no Unit Price is included in Attachment 7 shall be established by CET prior to assignment to CONTRACTOR of the Customer Contract.

b. No changes in the prices set forth in Attachment *7* may be made at any time while this Agreement is in force without the prior written consent of CET.

c. The Unit Prices in Attachment *7* include all costs, labor, benefits, materials, equipment, transportation, storage, overhead, applicable federal, state and local sales, service and excise taxes, other expenses and profit associated with performing the Work.

8. Compensation

a. Each Customer Contract will identify as the "Utility Incentive Share" the amount or portion of the total price of the Customer Contract to be paid by CET, and as the "Customer Share" the amount or portion of the total price of the Customer Contract to be paid by the Customer.

b. CONTRACTOR agrees to submit invoices to CET for the Utility Incentive Share of Customer Contracts upon or after submission of the certificate of completion. The invoices must comply with all requirements of CET with respect to the content, form, detail and supporting documentation, which shall include, at a minimum, each customer's name, address, site ID as assigned by CET.

c. CET agrees to make payment of the approved Utility Incentive Share of the price of Customer Contracts, and any Customer Share of the price of Customer Contracts collected by CET as down payment, under the terms of this Agreement no later than (30) days after receipt of CONTRACTOR's complete and accurate invoice.

d. In the event that, after payment by CET of any part of the Utility Incentive Share, CET, the Utility, a court or an arbitrator (or panel of arbitrators) determines that any part of the Customer Contract price was not earned or must be rebated for any reason, CONTRACTOR shall rebate the unearned or rebated amount to CET within ten (10) business days of receiving notice of the determination.

e. Interest shall accrue on amounts owed by either party more than sixty days past due at a rate equal to the prime rate then published by the Wall Street

Journal.

f. CONTRACTOR shall invoice the Customer for the balance of the Customer Share of the contract price, less any deposit, only after CONTRACTOR has provided CET a Certificate of Completion.

g. Neither CET nor any Utility shall have any liability for failure of a Customer to pay any invoice for the Customer Share. CONTRACTOR acknowledges that it alone bears the risk of non-payment by a Customer for the Customer Share.

9. Representations, Warranties and Covenants of CONTRACTOR

CONTRACTOR represents, warrants, and agrees as follows:

a. It possesses the technical and professional expertise and the fiscal capability necessary to carry out any Work authorized under this Agreement in a prompt, fair and workmanlike manner.

b. Insurance Provisions

i. It will meet all insurance requirements listed in Attachment 8, Berkshire Gas – Insurance Documentation Section.

ii. Before commencing any work CONTRACTOR shall provide CET with an original Certificate of Insurance, listing CET, Berkshire Gas and their respective offices, agents, and employees, as additional insureds. Said insurance shall be primary and non-contributory with respect to the additional insureds.

iii. With regard to any and all claims against the additional insured by any employee of CONTRACTOR, anyone directly or indirectly employed by CONTRACTOR or anyone for whose acts CONTRACTOR may be liable, the indemnification obligation shall not be limited by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR under workers' compensation acts, disability benefit acts or other employee benefit acts.

iv. All insurers shall have at least an A- (excellent) rating by A.M. Best and be qualified to do business in Massachusetts.

v. CONTRACTOR shall waive all rights of recovery against CET, Berkshire Gas and any of their affiliates for any loss or damage covered by said policies. Evidence of this requirement shall be noted on all Certificate of Insurance provided to CET.

vi. It is expressly understood by the parties to this Contract that it is the intent of the parties that any insurance obtained by CET or Berkshire Gas is deemed excess, non-contributory and not co-primary in relation to the coverage(s) procured by the Contractor or any of its respective consultants, officers, agents, subcontractors, employees or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of the aforementioned may be liable by operation of statute, government regulation or applicable case law.

vii. The CONTRACTOR will maintain tail coverage for five years on any policy written on a “claims made” basis.

viii. CONTRACTOR shall maintain in effect all insurance coverages required under this Agreement at the CONTRACTOR's sole expense and with insurance companies acceptable to CET until final completion and

acceptance of the entirety of the contracted work, or longer if so provided in this Agreement (such as with respect to completed operations coverage).

ix. The subcontractor shall continue to carry Completed Operations Liability Insurance for at least three years after either 90 days following Substantial Completion of the Work or final payment to the Contractor on any individual project, whichever is later.

x. Certificates of insurance showing required coverage to be in force must be delivered to CET prior to commencement of the Work.

xi. In the event CONTRACTOR fails to obtain or maintain any insurance coverage required under this Agreement, this shall be considered a material breach of the contract, entitling CET, at its sole discretion, to purchase such equivalent coverage as desired for CET's benefit and charge the expense to the CONTRACTOR, or, in the alternative, exercise all remedies otherwise provided in the contract, or as permitted by law or equity.

xii. Every insurance policy providing the coverage required in this provision shall contain the following or equivalent clause: "No reduction, cancellation, or expiration of the policy shall be effective until thirty (30) days from the date written notice thereof is actually received by the insureds named thereunder." Upon receipt of any notice of reduction, cancellation or expiration, CONTRACTOR shall immediately notify CET.

xiii. CONTRACTOR represents that it has provided a copy of the insurance provisions of this contract to his insurance agent and/or broker, and that the CONTRACTOR has instructed the agent/broker to provide insurance in full compliance with the terms and conditions herein.

xiv. CONTRACTOR will require that any of its subcontractors relative to the work covered by this Agreement have insurance which satisfies the requirements applicable to CONTRACTOR hereunder.

c. CONTRACTOR shall pay required federal, state and local property, license, privilege, sales, use, excise, gross receipts, and other like taxes which may, now or thereafter, be applicable to the Work under this Agreement.

d. CONTRACTOR is entering into this Agreement in good faith, without fraud, and that it is supplying the materials and performing the Work provided for in this Agreement solely on its own behalf, without connection with, or obligation to, any undisclosed person or firm.

e. CONTRACTOR shall maintain written paper records of all Work performed and products installed under this Agreement for a minimum of (5) years from the time Work was performed, including, but not limited to records of data collected, visits made, materials furnished or installed, individual staff providing the services, costs incurred, invoices and agreements. Copies of these records shall be made available to CET within five (5) business days, upon request.

f. Work at Customers' premises under this contract shall be in conformance with the requirements of all applicable laws, ordinances, codes, regulations and provisions of this Agreement, and that all warranties from CET to Customers, whether express or implied by law shall be satisfied.

g. CONTRACTOR shall obtain and pay for all necessary permits and licenses required by law, and shall abide by all applicable federal, state, and local laws, regulations, ordinances and codes. CONTRACTOR acknowledges that any inspection of its Work performed by or on behalf of CET shall not relieve

CONTRACTOR of responsibility for its own Work and is not a substitute for inspection by a state or local government inspector.

h. CONTRACTOR shall guarantee materials provided by the CONTRACTOR and installed pursuant to this Agreement against any defect in materials, manufacture, design or installation for a period of one year from the date the materials are provided and/or installed, whichever is later.

i. CONTRACTOR shall remedy any defects of a non-emergency nature promptly, and within Thirty (30) days, upon notice by the Customer or CET, without charge to CET or the Customer. CONTRACTOR shall notify CET of repair date within two (2) business days. CET shall notify CONTRACTOR upon receipt of any complaints by a Customer for Work performed by CONTRACTOR and CONTRACTOR shall immediately notify CET whenever it receives from a Customer any request for correction of defective Work or materials.

j. CONTRACTOR shall remedy any defects of an emergency nature immediately upon notification from Customer or CET. CONTRACTOR shall notify CET when emergency defects are remedied. If CONTRACTOR fails to respond to notification of emergency within the required timeframe, repairs will be completed at CONTRACTOR's expense. Examples of defects considered to be emergencies are those that include, but are not limited to: conditions that might impact occupant health or safety, those that would impact proper operation of any existing mechanical systems, etc.

k. CONTRACTOR shall staff each Customer Contract with a crew chief holding a current and valid Building Performance Institute certification as a crew chief, or equivalent approved in advance by CET, or a U.S. Department of Energy "crew chief" certification if and when available.

l. CONTRACTOR shall obtain and have its employees obtain, as applicable, all other training, certificates, authorizations and other credentials required by Attachment 8, as revised by CET from time to time.

m. CONTRACTOR is, at the date of execution of this Agreement, in compliance with all applicable federal and state wage and benefit laws and regulations, and has not been cited by any governmental authority for violation of any such law or regulation within five (5) years prior to such date. CONTRACTOR shall notify CET in writing of any such citation received by CONTRACTOR during the term of this Agreement.

n. CONTRACTOR is, at the date of execution of this Agreement, in compliance with all applicable federal and state workplace safety laws and regulations and has not been cited by any governmental authority for violation of any such law or regulation within five (5) years prior to such date. CONTRACTOR shall notify CET in writing of any such citation received by CONTRACTOR during the term of this Agreement.

o. CONTRACTOR shall be fully responsible for its own employees and subcontractors, including but not limited to direction, supervision, training, compensation tax withholdings, benefits, insurance, classification and verification of work status.

p. CONTRACTOR shall give reasonable consideration to employing individuals who have received training in weatherization and other energy conservation skills in

Massachusetts training programs.

10. Prohibited Conduct by CONTRACTOR
    a. CONTRACTOR shall not distribute homeowners' names and/or addresses to any other contractor, vendor, or any other organization or agency. Customer names and/or addresses may not be used for any advertising or other promotional purpose.
    b. CONTRACTOR warrants and represents that CONTRACTOR and its employees, subcontractors and all other persons or entities having access to the customer information by or through the CONTRACTOR have the appropriate safeguards in place to prevent the release, disclosure or use of any customer information received from CET or its utility clients and customers, and further agrees to use such information solely for the purpose of performing the Work under this Agreement.
    c. CONTRACTOR shall not, while performing Work hereunder, perform or offer to perform for such Customer any work or services not included within the scope of the Customer Contract assumed hereunder without the advance express written consent of CET, or furnish, directly or indirectly, to such Customer materials, literature or information not authorized by CET (including but not limited to vendor-branded handouts and promotional materials).
    d. Except to the extent otherwise approved in writing by CET, any materials, labor, equipment, supplies or services CONTRACTOR furnishes to a Customer beyond the scope of an assumed Customer Contract must be the subject of a separate contract or purchase order between CONTRACTOR and the Customer, to which CET is not a party.
    e. CONTRACTOR shall not charge a Customer directly for any services compensated for under this Agreement, except the unpaid Customer Share identified by CET in the Customer Contract.
    f. CONTRACTOR shall properly classify its workers as employees or independent contractors consistent with federal and state laws, including but not limited to Mass. General Laws ch. 149, Section 148B.

11. Termination
    a. CET may terminate this Agreement for any of the following reasons:
        I. A breach of any provision of this Agreement by CONTRACTOR;
        II. CET's reasonable dissatisfaction with the quality of the materials and services provided by CONTRACTOR pursuant to this Agreement;
        III. The receipt by CET of Customer complaints which CET believes to be warranted, regarding the failure of CONTRACTOR to keep appointments or lack of promptness in performing services;
        IV. . The discovery by CET that any of the representations made by CONTRACTOR in this Agreement or in its proposal or

Statement of Qualifications are false;

V. Conduct of CONTRACTOR or its staff, which in CET's sole reasonable judgment, is improper, offensive to Customers, discriminatory, dishonest or unlawful in any respect, including but not limited to acts or omissions for which CONTRACTOR receives a citation, charge, assessment or other complaint by any governmental authority;

VI. Termination or substantial amendment of CET's contract with a Utility which affects CET's ability to perform under this Agreement.

b. CONTRACTOR may terminate this Agreement by providing thirty (30) days written notice to CET. All Work in progress shall be completed according to the terms of this Agreement, unless CET elects to relieve CONTRACTOR of responsibility for incomplete Work.

c. In the event either party terminates this Agreement, payment for any partially completed Work authorized under this Agreement at the effective date of termination will be pro-rata. CET reserves the right in such cases to assign to another contractor the responsibility for completion of any Work not completed by CONTRACTOR prior to the effective date of termination.

CET also reserves the right to make any termination notice effective only upon the completion by CONTRACTOR of Work begun prior to the termination notice. CET shall be entitled to deduct the amount of any claims, damages and liabilities CET may have against CONTRACTOR under this Agreement or otherwise from unpaid amounts earned by CONTRACTOR at the time of termination. If the amount of CET's claims, damages and liabilities against CONTRACTOR exceeds the unpaid amount earned, CONTRACTOR shall pay CET the difference within thirty (30) days after the Agreement termination date.

d. Termination of this Agreement shall not relieve CONTRACTOR of any warranties or other obligations expressed herein which by their terms are intended to extend beyond termination.

12. Indemnification

a. To the fullest extent permitted by law, CONTRACTOR agrees to defend, indemnify and hold harmless CET, any Utility or other agents, servants, employees and others acting in concert with them from and against any and all claims, damages, loss or expense (including attorney's fees) arising out of or resulting from the performance or non- performance, in whole or in part, of CONTRACTOR's Work, including, but not limited to, claims for injury (including death) to persons (including employees, agents or subcontractors of CONTRACTOR), and damage or loss to property, whether in contract or in tort, or based on strict liability, caused in whole or in part by any act or omission of CONTRACTOR or those employed by it, or working under those employed it at any level (regardless of whether or not caused in part by a party indemnified hereunder) which relates to or arises from: the CONTRACTOR's Work; the failure of CONTRACTOR to satisfy any term, condition or obligation under this Agreement or any Customer Contract, CONTRACTOR's failure to pay any and all federal or state payroll taxes or

contributions for unemployment insurance, worker's compensation, pensions and retirement benefits; the negligence or willful or reckless misconduct of persons performing CONTRACTOR's Work; or the misuse or prohibited disclosure of information of CET, the Utilities or Customers, including the economic loss suffered by any of them as a result of such disclosure.

b. With respect to claims against any person or entity indemnified under this
c. paragraph by any employee of the CONTRACTOR, the CONTRACTOR's subcontractors, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this paragraph shall not be subject to any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR, or the CONTRACTOR's subcontractors under workers' compensation acts, disabilities benefit acts or other employee benefits acts.

13. Compliance with Laws

a. This Agreement is subject to federal and state laws and regulations regarding nondiscrimination. As a material term of this contract, CONTRACTOR agrees to comply with all such applicable laws and regulations. The terms and provisions of the Equal Opportunity Clause, Sections 60-1.4, 250.4 and 741.4 of Chapter 60 of Title 41 of the Code of Federal Regulations, regarding "Nondiscrimination in Employment by Government Contractors and Subcontractors," are incorporated by reference and made a part of this Agreement. In addition, CONTRACTOR agrees to comply with the provisions of 29 C.P.R. Part 470. Upon request, the CONTRACTOR shall supply CET with a certificate demonstrating compliance with the foregoing.
b. CONTRACTOR shall comply with all applicable provisions of and regulations under the Occupational Safety and Health Act of 1970, as amended, and all laws, rules and regulations applicable to the hiring of disabled veterans, veterans of the Vietnam era, Uniformed Services member, and individuals with physical or mental disabilities.

14. Mechanics' Liens

CONTRACTOR shall keep each Customer's property free of liens and claims and shall defend, indemnify and hold CET and any Customer harmless from all expenses and losses incurred as a result of liens or claims filed by subcontractors and vendors of subcontractors and others claiming by or through CONTRACTOR. If a lien or claim is filed by a vendor or subcontractor, CONTRACTOR shall cause such lien to be discharged or bonded off within forty-eight (48) hours of notice by CET. If CONTRACTOR fails to do so, CET may, without prejudice to any other remedies available at law, pay all sums necessary to obtain a release or discharge of such lien and deduct those sums, including costs, expenses and reasonable attorney's fees, from amounts due or to become due CONTRACTOR.

15. Miscellaneous

a. This Agreement is made pursuant to and shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts without regard to rules governing conflicts of law. This Agreement is further subject to, and is intended to be in conformity with and governed by, all applicable

federal, state, and local statues, regulations, ordinances, directives, orders and codes governing the provision of weatherization and other home energy performance materials and equipment.

b. This Agreement consist of a main document of thirteen (13) pages and the following Attachments:

Attachment 1.	**Mass Save Program Description Contractor**
Attachment 2.	**Background Check Policies**
Attachment 3.	**Merit-Based Work Allocation System**
Attachment 4.	**IIC Performance and Disciplinary Procedures Policy**
Attachment 5	**Materials Installation Standards Customer**
Attachment 6.	**Referral Process**
Attachment 7.	**Schedule of Unit Prices**
Attachment 8.	**Insurance and Credentials Requirements**
Attachment 9.	**Specified Measures Contractor Agreement**
Attachment10	**Duct Sealing & Insulation Contractor Agreement**
Attachment 11.	**RCS Co-Brand License Agreement**

c. These attachments are hereby incorporated into and made an integral part of this Agreement.

d. CONTRACTOR may not assign this Agreement or further subcontract its obligations under this Agreement without the express written consent of CET.

e. This Agreement supersedes any prior agreement between parties and sets forth the entire agreement of the parties with respect to the subject matter hereof and may not be altered, changed, abridged or amended other than in writing signed by both parties hereto.

f. Failure of CET to complain of any action or non-action on the part of CONTRACTOR, no matter how long the same may continue, shall never be considered a waiver of any of its rights hereunder. No waiver at any time or any of the provisions hereof by CET shall be construed as a waiver of any of the other provisions hereof, or as a waiver at any subsequent time of the same provisions.

g. Should one of more phrases, clauses, sentences, or paragraphs of this Agreement be invalid, the remaining portions of this Agreement or any part thereof shall not be thereby affected, and this Agreement shall be construed as if such invalid portion or portions had not been inserted into this Agreement.

h. The individual parties signing this Agreement warrant and represent that they have the proper corporate or other authority to execute this Agreement.

i. The headings of this Agreement are used solely for convenience and are not to be used in construing or interpreting this Agreement.

CONTRACTOR certifies to CET that they are in compliance with the portions of this agreement and for all work under this agreement specific for the member utility Berkshire Gas. Non-compliance with these Berkshire Gas-specific requirements by the Contractor will result in the immediate termination of this agreement between CET and the Contractor: Initial_____and Date_____.

IN WITNESS WHEREOF, the parties have executed this contract as of the date written below.

CENTER FOR ECOTECHNOLOGY, INC.

BY:_____DATE:_____

CONTRACTOR

BY:_____DATE:_____

Attachment 1

Program Description

The focus of the Mass Save® Home Energy Assessment is to deliver on-site services to residential customers and motivate the customers to implement recommended energy efficiency measures. A customer can receive the Home Energy Assessment (HEA) through a variety of mechanisms, including a direct referral by calling the general Mass Save statewide toll free phone number, from a Program Administrator, Program Vendor, trade ally, and/or as a result of marketing.

The HEA includes an evaluation of relevant energy efficiency measures and renewable energy measures in the home. The service is fuel-neutral, meaning that end-uses are examined regardless of the fuel used. Specifically, during the HEA, a whole house approach is used to evaluate the residence. This includes a review of the building's HVAC and DHW systems, lighting, thermal building envelope and appliances.

The objective of the Home Energy Assessment is that the customer has an opportunity to understand the impact of relevant energy efficiency measures and improvements that can be implemented in the home and is motivated to implement major measures. The Energy Specialist will offer Instant Savings Measure (ISM) and, Energy Efficiency Incentives to customers in conjunction with the Home Energy Assessment.

The program is designed for the resident to accompany the Energy Specialist in the examination of the building as appropriate so that explanations and education occur during the course of the visit. The customer is provided with a written report that includes a list of measures and available incentives. If needed, the Energy Specialist will provide the necessary paperwork to process the incentives.

The resulting "Customer Agreement" is based on the weatherization measures the customer has chosen for implementation. It details the measures, quantities, Utility

incentive share and customer share of the cost to perform the work. CET collects 1/3 of the customer share as down payment upon execution of this agreement between CET and Customer. CET will assign work to Independent Installation Contractors (IIC's) utilizing a merit-based work allocation system (see Attachment 3). To make this assignment, CET will provide the IIC with a work order that details the same measures, quantities and costs detailed in the Customer Agreement. Within two business days, the IIC will then schedule with the customer a time to perform the work and submit an acceptance and work schedule document to CET. Work will then proceed according to the terms of the Mass Save Program Independent Installation Contractor Agreement. If the IIC cannot reach the customer for scheduling within 2 business days, the IIC will report this to CET and keep CET apprised of reasonable efforts to contact the customer to schedule the work. Should the IIC be unable to contact the customer to schedule the work, CET will verify the customer's unresponsiveness and deactivate the work order if necessary, in which case CET will assign a substitute project.

Should the IIC choose not to accept an assigned work order, it must notify CET within 2 business days in which case CET will not assign a substitute work order.

Attachment2

CONTRACTOR BACKGROUND CHECK POLICY

[in this Attachment "Contractor" refers to CET; "subcontractor" refers to CONTRACTOR]

CET Subcontractor Contracts

Employee Background Checks

Subcontractors are required to ensure that their employees who are providing services to CET successfully pass a Contractor Employee background check. These background checks are to be done by the Subcontractor, at the Subcontractor's expense, prior to that employee performing or continuing work for CET, and a background check program should be administered on a continuous basis throughout the period of performance of services for CET.

The Subcontractor is responsible for maintaining documentation regarding these background checks through the term of the agreement and for three years following the expiration or other termination of the agreement. The Subcontractor must certify in writing to CET that these requirements for all employees performing Work under this agreement have been fulfilled prior to commencement of Work. Non-compliance of these requirements by the Subcontractor will result in the immediate termination of this agreement between CET and the Subcontractor.

The Subcontractor shall be responsible for administering the background check program, such that the program satisfies the minimum requirements outlined below and are made in accordance with CET's obligation to **Berkshire Gas.** Additional information has been provided as to this Addendum providing Berkshire Gas' background check policy requirements. It is the Subcontractor's responsibility to maintain compliance with all applicable laws and regulations in conducting background checks and maintaining information relating thereto, including without limitation the Fair Credit Reporting Act and the Consumer Credit Reporting Reform Act of 1996.

Minimum Requirements

- **Identification Verification/Eligibility to Work in the Country**
- **Criminal History Background Checks**
- **Sex Offender Registry Search**
- **Residential Address Verification**
- **Employment History Verification**
- **Motor Vehicle Driving Record Check**
- **Employees Previously Terminated or Removal from CET Work for Cause**
- **Five (5) panel Drug Screening**

1. Identification Verification/Eligibility to Work in the Country

Contractors performing services for CET must be able to provide evidence to CET or its agent that they have verified Contractor Employees' identities and that all Contractor Employees are legally eligible to work in the country where the work is to be performed. CET requires that U.S. Contractors complete a Social Security trace and or a Consent Based Social Security Number Verification – CBSV on their Contractor Employees and match results of this check with other identification documents provided by their employees. This search reveals all names and addresses historically associated with the Contractor Employees provided number, along with the date and state of issue, and verifies if the number is currently valid and logical. This search may also reveal the information that can then be used to determine the parameters of other aspects of the background investigation. Adverse action should not be taken based solely on this information and may require further verification with the Social Security Administration (SSA) or the Department of Homeland Security (DHS).

2. Criminal History Background Checks

Contractors shall ensure that all their employees performing work or providing services to CET are subjected to a criminal history background check. Such checks shall be conducted on all names, including alias names that are provided or developed, and include County, State, and Federal checks based on jurisdictions of work and residence for the past 7 years, as well as international jurisdictions, if available. Checks must be performed on all current Contractor Employees and any new Contractor Employees hired or assigned to support the CET contract. If the Contractor has had a pre-employment criminal history check process in place and can provide documented evidence that employees assigned to the CET contract have been subjected to the criminal history check within the last 3 years, then additional checks are not necessary.

The following criteria should be used as guidance by the Contractor in making the determination of whether the Contractor Employee will be allowed to perform work specified in the contract between your company and CET. These criteria should also be evaluated by the contractor prior to making a request to CET for the Contractor Employee to be approved for assignment to the CET contract:

- Number of convictions
- Nature, seriousness and date(s) of occurrence of the offense
- Rehabilitation
- Relevance of the crime committed in relationship to the work to be performed
- Unreasonable risk posed to CET property or to the safety of employees, other Contractors and/or customers

During the term of the contract if the Contractor becomes aware of information concerning a criminal conviction of a Contractor Employee that would fit the above criteria for reporting to CET, this information shall be forwarded to CET's point of contact for determination whether the Contractor Employee should be allowed to continue working or providing services for CET.

3. Sex Offender Registry Search

Most states maintain a sex offender database that is available as a source of public record. Individuals convicted of such crimes as sexual assault, aggravated criminal

sexual conduct, luring or enticing, and kidnapping, or who have been found to be repetitive and compulsive by experts and the courts are required to register with their state authorities. Specific registration requirements are dictated by state laws and are based on dates of offense, sentence and/or release from custody. Consistent with the scope of the Criminal History Search, a search will be conducted in the applicant's provided and developed names, in the state(s) of the applicant's residence and place of work, if a statewide repository is maintained and accessible as public record.

4. Residential Address Verification

Contractors must perform a seven-year address verification on all new Contractor Employees hired to support the CET contract. The purpose of this check is to confirm that the address exists and relates to a real property, and to establish that the individual permanently resides or previously resided at the address. Verifying the address given by a prospective employee is important because it confirms that other information provided is correct. An individual may wish to omit their current or former address to conceal adverse information, such as criminal convictions.

5. Employment History Verification

Contractors must perform a three-year prior employment history verification on all new Contractor Employees hired to support the CET contract. The purpose of this check is important as it serves to check the accuracy of information provided by the applicant. This check may also reveal prior employment with CET that should further be explored. An individual may wish to omit prior employment history to conceal adverse information, such as criminal convictions.

6. Motor Vehicle Driving Record Check

All Contractor Employees who are required to operate a motor vehicle in conjunction with their contract with CET must be legally licensed and hold a valid driver's license appropriate to the vehicle being driven. This requirement applies to both Contractor owned or leased vehicles. A motor vehicle driving record check to include a commercial driver license search, when applicable, must be conducted by the Contractor annually in order to validate this requirement.

7. Employees Previously Terminated or Removal from CET Work for Cause

CET will not permit Contractor Employees who were previously employed by CET and were terminated by CET for cause, or Contractor Employees who were previously removed from working on any contract for CET to perform contract work for CET.

8. CET's Right to Revise Requirements for Contractor Background Checks

CET reserves the right to revise its requirements for Contractor Employee background checks during the contract term, which the Contractor must comply with. Any such revisions will be provided in writing.

Attachment 3
Merit Based Work
Allocation System

Overview

The scoring methodology for Berkshire Gas Mass Save participating contractors is intended to provide a consistent review of each job that is completed, and inspected, and ensure that all contractors are maintaining compliance with the program requirements. Each job is scored in three general categories: **Contractor Document Quality**, **Quality of Work**, and **Customer Satisfaction**. All installed measures and required documents are scored according to the section below. The total score for each general category (Contractor Document Quality, Quality of Work, and Customer Satisfaction) is defined as earned points divided by total possible points. Once the scores are obtained for each general category, they are weighted and added together to determine the total score out of one hundred percent. All of the job scores in a given period are averaged together to provide an overall contractor score for that period.

Starting in the last quarter of 2015, acceptable contractor return rates has been added as a criteria for maintaining Active Status. These return rates are calculated dividing total returns by the total number of inspected jobs. Berkshire Gas is committed to achieving a positive customer experience and has the expectation that contractors will strive towards making as few returns as possible.

Merit Based Allocation is prioritized by a contractor's status. Contractors are either placed in an active or non-active status. Active Status means that contractors are in compliance with program requirements, are maintaining an overall job score average of 70% or above and have an overall return rate of 25% or below. Contractors that do not meet these requirements will be place on a non-active status. No work will be assigned to these contractors until satisfactory resolution of the deficit. The procedure for returning to Active status is outlined in the IIC Performance and Disciplinary Procedure policy, Attachment 4.

Scoring Categories

Contractor Document Quality

Contractors are scored on the quality of their invoice and necessary documents submitted for each job completed. Each line item can earn up to 1 point.

Completed Job Packet

Category	Points
Pass-Compete	1
Fail-Incomplete	1

Paperwork Completeness

Category	Points
N/A	Not counted
Pass-Complete	1
Fail-Incomplete/Missing	0

Discrepancies

Category	Points
Good-No Discrepancies	1
Fair-No resubmission required	.8
Poor-Resubmission is required	.67
Fail-Discrepancies will prevent payment	0

Quality of Work

Job Overview – Each item can earn up to 1 point

FYI Needed	Points
Yes	0
No	1

Return/Repair Needed	Points
Yes – Responsible*	0
Yes-Not Responsible	1
No	1

*if return is required due to contractor responsibility points will not be given for FYI category

Billing Adjustment Needed	Points
Yes	0
No	1

Discrepancies	Points
Yes	0
No	1

Installed Measures (Insulation, Air Sealing, etc.) – Total points for this section are determined by the number of items that can be inspected. Items which are N/A or N/I are not included in the score. Any item checked as a Safety Issue that the contractor is responsible for, automatically fails the entire job.

Installed Measures	Points
N/A or N/I (Not Inspected)	Not Counted
Pass	1
Conditional Pass	.8
Fail	0
Safety Issue – Responsible	Fails entire job, Score=0

Overall Quality of Work Score

To determine the **Overall Quality of Work Score,** the Quality of Work Score will be multiplied by 1 if no return/repair is required or 0.8 if a Return/Repair is required and the contractor is determined to be at fault.

Customer Satisfaction

All customers are asked to complete a satisfaction survey at the final inspection. This survey is intended to allow the customer to provide feedback on their overall experience working with the contractor that competed their work. – Each line item can earn up to 1 point.

Customer Service Survey	Rating Points
Excellent	1
Good	1
Fair	.7
Poor	.4
No Opinion	Not Counted

Overall Contractor Score

Once the total scores for each of the three general categories **(Contractor Document Quality, Quality of Work and Customer Satisfaction)** are determined, each category is weighted based on the chart below.

Quality of work	60%
Customer Satisfaction	25%
Document Quality	15%
Overall Contractor Score	**100%**

The weighted scores are then added together and multiplied by 100 to determine the overall contractor score out of 100%. If a customer service survey cannot be obtained, the weighing will change to the following:

Quality of Work	75%
Document Quality	25%
Overall Contractor Score	**100%**

Attachment 4

IIC Performance and Disciplinary Procedures Policy

It is expected that all Independent Installation Contractors ("IIC"s) will meet the Mass Save® HES program expectations, will complete their work scopes as specified on time, will perform work to the specified standards, and will deliver excellent service to customers, Center for EcoTechnology (CET), and the Utility. However, in the rare cases wherein an IIC has performance issues that negatively impact the Program and/or the customer experience, CET may in consultation with the Utility apply the following disciplinary procedures.

1. IIC PERFORMANCE – IICs participating in the Mass Save® Home Energy Services Program shall adhere to the following business practices:

    a. Professional Conduct – All IIC officers, directors, partners, managers, members, employees, agents and representatives shall treat all Customers fairly and deliver promised services in a timely, competent, professional, and reasonable manner.
    b. Professional Courtesy – Whenever representing the Program, All IIC officers, directors, partners, managers, members, employees, agents and representatives shall conduct themselves in a professional, respectful, and reasonable manner when interacting with any Utility staff, CET staff, Customers, governmental officials, media, or other Program stakeholders.

2. DISCIPLINARY PROCEDURES –CET, in its capacity as Lead Vendor to the Program, reserves the right to impose any of the following disciplinary measures at any time.

    a. Suspension of Merit Based Work Allocation-(Non-Active) CETmay deem that an IIC will be Non-Active from Merit Based Work Allocation. CET may notify the IIC verbally or by email of such designation, and include the details of the infractions and the basis of this determination. Included in that communication will be what infractions need to be corrected and on what time table for the IIC to once again begin receiving Merit Based Work Allocation. Grounds for designation of Non-Active shall include, but not be limited to:
        i. Non-Compliance with Program Policies, Procedures and Conduct Requirements
        ii. Failure to adhere to the policies, procedures and conduct requirements of the Program.

    b. Not in Good Standing – In consult with the Utility, CET may deem that an IIC is "Not in Good Standing" with respect to the Program. CET shall notify the IIC in writing of such a designation, and include the details of the infractions and the basis of this determination. As soon as practicable following the notice (but in no

event more than fifteen (15) days from such notice), CET will schedule a meeting with the IIC to establish a plan to return to compliance with the Program's requirements (the "Performance Improvement Plan"). A Performance Improvement Plan must include actionable improvement by the IIC within a reasonable timeframe that is clearly stated in the Performance Improvement Plan (measurable improvements should occur within 30 days; the total time to remediate may depend upon the nature or severity of the infractions). An IIC that is deemed "Not in Good Standing" shall be eligible for continued participation in the Program; however, the IIC and its officers, directors, partners, managers, members, employees, agents and representatives shall not be eligible to serve on the Best Practices Working Group, or in other Program related forums as deemed by CET or the PAs while "Not in Good Standing". Failure to adequately address the issues in the Performance Improvement Plan within thirty (30) days may result in a suspension or termination. Grounds for designation of "Not in Good Standing" shall include, but not be limited to:

i. Non-Compliance with Program Policies, Procedures and Conduct Requirements
ii. Failure to adhere to the policies, procedures and conduct requirements of the Program.

c. Suspension/Termination – In consultation with the Utility, CET may suspend or terminate an IIC's participation in the Program. A suspended IIC is not eligible to participate in the Program during the suspension period. CET shall notify the IIC in writing of any suspension, and such notice shall include: (i) the reason(s) for suspension; (ii) the suspension period: and (iii) the actions that CONTRACTOR must take in order to participate in the Program after the suspension period. A terminated IIC is not eligible for further participation in the Program. CET shall notify the IIC in writing of termination, and such notice shall include the reason(s) for termination. Grounds for suspension or termination shall include, but not be limited to:

i. Failure to Respond/Cooperate – an IIC's failure to reasonably respond to or cooperate with CET or the Utility, including, but not limited to, the failure to meet and work in good faith with CET in order to establish a Performance Improvement Plan.
ii. Failure to Achieve Improvements Set Forth in a Performance Improvement Plan within the time specified - an IIC's failure to adequately improve in accordance with any Performance Improvement Plan imposed in Section 2(a) in the time specified in such Performance Improvement Plan.
iii. Non-Compliance with Program Policies, Procedures and Conduct Requirements – an IIC has failed to adhere to the policies, procedures and conduct requirements of the Program.

iv. Misrepresentation/Fraudulent Activity – an IIC has submitted false or fraudulent documentation to the Utility, CET or the Program at any time.
v. Grossly Inappropriate Behavior - an IIC has engaged in grossly inappropriate behavior while at a customer's home or in other Program settings. Grossly inappropriate behavior may include lewdness, extreme obscenity, threat of violence, or other acts of similar magnitude.
vi. Major Safety and/or Quality Violation – an IIC has engaged in a major safety and/or quality violation.

Mass Save Home Energy Services Program Standard for Materials, Installation, and Conduct For Energy Efficiency Measure Installation Contractors

Initial Publication Date: May 13, 2010

Revision Date: January 25, 2012

Updated: October 31, 2018

Version 2.1

This Standard applies to all work performed under the Mass Save Home Energy Services Program for customer contracts entered into **beginning October 1, 2016**. Program Administrators will be establishing a Quality Assurance program to verify that work meets the requirements in this Standard. Proposed changes or additions to the Standard will be considered on a regular basis by the Program Administrators or their designee.

By Program Administrators:

TABLE OF CONTENTS

1.0 PROGRAM DESCRIPTION

The primary objective of the Mass Save Program (the Program) is to provide residential customers with energy efficiency recommendations that enable them to identify and initiate the process of installing cost-effective energy efficiency upgrades. The Mass Save Program makes it easy, clear, and compelling for customers to participate in all comprehensive energy efficiency programs by providing information through bold outreach mechanisms, incentives, and multiple financing options.

The Program promotes a house-as-a-system approach and focuses on the home's thermal envelope (shell insulation and air leakage conditions), mechanical systems (HVAC & DHW), and lighting and appliances to identify cost effective energy efficiency improvement and/or replacement opportunities.

This systematic approach to home improvement that addresses all aspects of building systems requires clear standards to maximize energy savings and assure customer satisfaction. It is important to note that the Mass Save Standard for Materials, Installation, and Conduct (the Standards) is primarily focused on traditional weatherization materials and strategies. The Program Administrators ("PAs") view these Standards as a "living document" that will be updated periodically as the Program continues to evolve.

The Program will coordinate with other Massachusetts programs such as GasNetworks and COOL SMART to develop consistent standards across programs as well as to assure consistent customer education and promotion of the house-as-a-system approach.

Future revisions of the Standards may include alternative/new technologies and approaches for new measures (e.g., spray foam in attics).

The PAs are supportive of more coordinated statewide training as a means to ensure correct installation techniques for the Program. It is expected that training requirements will increase over time in order for contractors to retain their status as an authorized program contractor. The goal is to have a sustainable and experienced workforce that is focused on achievable maximum energy savings ready and able to meet customer demand.

2.0 CONTRACTOR QUALIFICATIONS AND RESPONSIBILITIES

The term "Contractor" as used in this document applies to any individual or company performing covered work that is being performed within the Mass Save program. This applies equally to vendors working directly for the PAs and to independent contractors doing work for homeowners.

The purpose of these guidelines and associated information is to codify the requirements of weatherization contractors who participate in the Mass Save Program. They are intended as *minimum* standards for participation in the program.

2.1 LICENSES and CERTIFICATIONS

a. CONTRACTORS must have all licenses and registrations required for their area of work by the Massachusetts Department of Public Safety. Appropriate documentation must be supplied to The Program upon request. Licenses include (but are not limited to): MA Home Improvement Contractor's License, MA Construction Supervisor License, and MA Lead Safe Certificate
b. CONTRACTORS must also obtain any certifications or other recognitions required by individual PAs.

2.2 MATERIALS

a. All materials supplied must meet applicable specifications.
b. All materials must conform to catalog listing.
c. Material substitutions are not allowed without a written pre-approval by the PAs.
d. CONTRACTORS will keep a SDS on the job site for every material used.

2.3 PERFORMANCE OF WORK

a. All labor to be performed in a workmanlike manner.
b. All work must be performed in a lead-safe manner according to all State and/or Federal Requirements in force at the time of the work.
c. All work must be performed in conformance with all applicable OSHA requirements and other governmental standards.
d. All weatherization work must be performed in conformance with applicable BPI standards or other standards as identified by Mass Save.
e. All work must be performed in compliance with all applicable state and local codes.
f. All measures installed must be in conformance with the Work Order.
g. Pre-Approved written Change Orders by the PA vendor and initial or sign-off of completion certificate by the homeowner are required before any modifications to the original Work Order are made.
h. CONTRACTORS *should attempt* to make acceptable repairs for all accidental damages made to a customer's property at the contractor's expense within 10 business days. Both the customer and the PA vendor must be informed when damages occur. The PA vendor will make the final decision as to when acceptable repairs have been made.
i. CONTRACTORS will treat homeowners and their property in a respectful and professional manner.

2.4 JOBSITE CLEAN UP

a. CONTRACTORS are responsible to remove all construction debris from the jobsite.
b. CONTRACTORS are responsible to restore every jobsite to its pre-work condition at project completion.
c. CONTRACTORS are strongly urged to use drop cloths for an additional measure to protect homeowners property/belongings

2.5 DOCUMENTATION

CONTRACTOR Documentation must conform to the requirements detailed in their program participation agreement including, but not limited to:

a. Before Starting Work - CONTRACTORS must document that a blower door test and combustion safety testing have been performed and an Order to Proceed has been issued. If tests are not able to be performed (e.g., electric heat, asbestos,

etc.) it must be noted in the paperwork.

b. After Work Completion - CONTRACTORS must submit documentation (signed by customer and contractor) that the approved Scope of Work is complete.

c. The Completion document must include:

- An itemized confirmation that the Program Audit recommendations were addressed.
- An itemized list of each measure, area, R-value, etc., installed.
- Upon project completion, document that post-blower door testing and post-combustion safety testing has been performed. Must be done on the day of completion.
- Proof of approved Change Orders by CUSTOMER and PA Vendor.

2.6 COMMUNICATIONS

2.6.2 CONTRACTOR communications with CUSTOMER

a. CONTRACTORS will be courteous to CUSTOMERS at all times.
b. CUSTOMERS and PA vendor must be notified as soon as possible if an appointment must be rescheduled, according to the terms of the Contractor Participation Agreement.
c. CONTRACTORS will clearly explain all work procedures and items to be installed to the CUSTOMERS home before and during the work process. *Program Specifications & Customer Guidance* form must be signed by the customer.
d. CONTRACTORS will answer all CUSTOMER questions in an honest and straightforward manner. If the CONTRACTOR does not know the answer to a question they will refer the CUSTOMER to PA vendor for an answer.
e. CONTRACTORS will inform CUSTOMERS of any fragile items in the work area and request that the CUSTOMER move those items to a safe location prior to start of work.
f. CONTRACTORS will ask CUSTOMERS for permission to use a household restroom.
g. CONTRACTORS will keep CUSTOMERS informed regarding estimated daily arrival, break, and departure times.
h. CONTRACTORS will document any problems and unusual situations as they occur.

2.6.2 CONTRACTOR communications with Mass Save

a. CONTRACTORS will respond promptly and accurately to communications from Mass Save and PA vendors.
b. CONTRACTORS will document problems and unusual situations and promptly report those to PA vendors.
c. CONTRACTORS will respond promptly to address problems as they occur.
d. CONTRACTORS will notify PA vendor of any changes to staffing that affect authorization to work in the program (certifications, background checks etc.)

2.7 CONTRACTOR ACTIONS REQUIRING Mass Save RESPONSE

2.7.1 Theft

Theft may result in immediate cancellation or suspension as a Mass Save Approved CONTRACTOR and full legal remedies including but not limited to prosecution. Theft includes but is not limited to:

a. Charging for materials not installed or labor not incurred.
b. Inflating the actual cost for services provided.
c. Unauthorized removal of CUSTOMER personal property.

2.7.2 Other Unacceptable Actions

The following CONTRACTOR actions, as examples but not limited to, may result in immediate cancellation or suspension as a Mass Save Approved CONTRACTOR. Additional training may be required before reinstatement as a Mass Save Approved CONTRACTOR.

a. Charging clients for services while job is open (one year period).
b. Soliciting or performing work on a customer's home outside the scope or context of rebateable weatherization work, for customers assigned to the CONTRACTOR through the program. (Note: If the CONTRACTOR brings the customer to the program as an IIC referral or through HPC customer acquisition then this clause would not apply but additional services would be required to be on a separate non- program contract with the customer.)
c. Providing false information to Mass Save, PA vendor, or the CUSTOMER concerning work requirements.
d. Failure to correct job deficiencies.
e. Use of inferior materials.
f. Repeatedly missing timelines.
g. Repeatedly performing work of poor quality.
h. Leaving the customer's property in a potentially dangerous condition.

2.8 BUILDING PERMITS

CONTRACTORS are required to obtain and to pay for all applicable permits, certificates of inspection, and license fees related to work performed through the Mass Save program.

2.9 CONTRACTOR'S INSURANCE All Mass Save CONTRACTORS shall:

a. Provide insurance at the coverage amounts listed in the program participation agreements with respect to the work they perform within the Program;
b. Maintain this insurance at their own expense and in full force and effect for the full term of the contract;
c. List each Mass Save Program sponsor as "additionally insured" on insurance certificates.

All policies shall be issued by companies authorized to write that type of insurance under the laws of the Commonwealth of Massachusetts.

CONTRACTORS shall provide minimum coverage with respect to the operations performed by any employee, subcontractor or supplier, as detailed in program participation agreements.

2.10 BACKGROUND CHECKS

CONTRACTORS must comply with all background check policies required by the individual PA for which the CONTRACTOR is approved to do work. Contractors must check with each LV on specific requirements

3.0 HEALTH AND SAFETY

3.1 OVERVIEW

The health and safety of CUSTOMERS, PROGRAM staff and CONTRACTORS is of primary concern to the Mass Save Program. It is important that all personnel maintain a high level of awareness concerning the potential hazards associated with the weatherization process. The requirements set forth in this standard provide only general guidelines for health and safety concerns.

CONTRACTORS must familiarize themselves with all the health and safety issues associated with weatherization. More specific information concerning indoor air quality problems can be obtained through the U.S. Environmental Protection Agency (EPA) and the U.S. Consumer Product Safety Commission.

Detailed specifications regarding the health and safety of workers in the construction industry can be found in Construction Industry OSHA Safety and Health Standards (29 CFR 1926/1910) that is available from the U. S. Department of Labor.

https://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926

The above standards are applicable to all CONTRACTORS, their employee's, associated workers, and all SUB-CONTRACTORS providing services using funding under the Mass Save program.

Each home weatherized under the Mass Save program must be individually assessed to determine the existence of potential hazards to CONTRACTORS or CUSTOMERS.

If unsafe conditions exist that would endanger the health or safety of the CUSTOMERS or weatherization CONTRACTOR, and those conditions cannot be corrected, no Mass Save work may be started on that home.

A Mass Save energy assessment must be completed prior to CONTRACTOR'S work. It is the CONTRACTOR'S responsibility to complete Combustion Safety Testing in accordance with the Building Performance Institute (BPI) Technical Standards for the Building Analyst Professional both prior to the work commencing and after the work is completed (test in and test out).

CONTRACTORS, their employee's, associated workers, and all SUB-CONTRACTORS are required to take all reasonable precautions against performing work on homes that will subject occupants to health and safety risks.

CONTRACTORS shall maintain a copy of their Health and Safety Policy, and train all employees accordingly. They shall supply Material Safety Data Sheets (MSDS) for products and materials used by their crews and have these documents available on all jobsites.

Adherence to worker health and safety and applicable OSHA standards are required for all jobs performed by CONTRACTORS their employee's, associated workers, and all SUB-CONTRACTORS.

CONTRACTORS shall comply with all state and federal lead safe work policies and practices. (See Appendix 16.1)

CONTRACTORS shall fully document and communicate to the PA vendor all health/safety related problems and concerns that might inhibit the installation of specified measures to program standards or could result in injury or property damage.

3.2 CONFIRM COMBUSTION APPLIANCE OPERATION

A. CONTRACTORS must confirm through documentation that a Carbon Monoxide test and complete combustion appliance inspection was performed before beginning work, and that a working CO alarm is in place. CONTRACTORS will be responsible for conducting this "test in" in accordance with the BPI Technical Standards for the Building Analyst Professional and providing the documentation.

B. Before leaving the site, the CONTRACTOR shall perform combustion safety tests in accordance with the BPI Technical Standards for the Building Analyst Professional and provide appropriate documentation.

C. Individuals performing these tests shall either hold the appropriate BPI certification, as determined by the Program Administrator, shall be an employee of a BPI Accredited company, or shall have other credentials approved by Mass Save such as a combustion safety module supplementing Boot Camp Authorization.

D. Results of these tests must be reported by CONTRACTOR in the completion documentation.

E. If systems fail the combustion safety tests in the BPI Technical Standards for the Building Analyst Professional, CONTRACTOR must immediately notify occupants and the Program.

Exceptions:
Tests are not required:

1) On direct vent or power vented appliances. CO testing should still be done whenever the exhaust port is accessible.
2) Where equipment is located in an isolated mechanical room with all combustion air from outside including from a vented attic or crawlspace. Note that all equipment in open basements must be tested.
3) When residents in a multi-unit dwelling are not being served by the Program, equipment belonging to those units does not need to be tested. However, visual inspection of that equipment should be made to identify potential health and safety concerns. If any potential concerns are noted, or if the results for the equipment that is tested may be adversely affected by including the other equipment, disclosures must be made to the customer and the building owner.

4.1 MEASURE INSTALLATION GUIDELINES

Through the Mass Save program, thermal shell improvements may be installed only after a comprehensive whole house assessment is conducted by a program-approved entity and an approved Scope of Work has been developed.

It is only through a whole house assessment that site-specific appropriate recommendations can be made. While a home may benefit from thermal shell improvements in theory, there may be existing conditions that would preclude safe implementation of the possible energy saving improvements.

Examples of such conditions include, but are not necessarily limited to

- Existing moisture problems
- Mold or the appearance of mold like substance
- Structural concerns
- Active knob-and-tube wiring (sign-off by a licensed electrician will be needed to proceed to ensure knob-and-tube wiring is not active)
- Existing conditions of specific building components
- Combustion safety issues
- Asbestos
- Inaccessibility
- Infestation
- Recessed lights verified by licensed electrician

Correcting these conditions is outside the scope of the Mass Save program.

Conditions precluding implementation of thermal shell improvements must be documented and explained to the individual customer. If the customer corrects the noted concerns at their own expense, then the recommended thermal improvements may be able to be implemented. Such corrections must be made prior to program work, and must be documented in writing to the satisfaction of the program.

Not every condition will be found before work. If any of the above is discovered during the course of approved work, the CONTRACTOR must contact the PA vendor for instructions to:

1. Disclose and leave specific areas unaltered
2. Disclose and suspend work until alterations are made by others
3. Disclose conditions to homeowner and proceed with work
4. Disclose and alter the work scope to account for conditions

5.0 MATERIALS

All materials shall be installed according to manufacturers' instructions and the standards in this section.

5.1 IMPERMEABLE AIR BARRIER MATERIALS

Materials must be durable, and restrict airflow through the material to no greater than 0.004 CFM_{75} per square foot as tested in accordance with ASTM E283 or E2178. Such materials include:

- Plywood,
- OSB,
- ½" gypsum board,
- Rigid closed cell foam boards meeting ASTM C578 and ICC ES AC12,
- Rigid fiberglass board with flame spread 25 FSK facing,
- Sheet metal flashing and aluminum coil stock,
- Foil faced bubble wrap,

- Peel-and-stick flashing membranes,
- Other air barrier materials as listed in Canada Mortgage and Housing Corporation Research Highlights Technical Series 98-109, "Air Permeance of Building Materials" (http://www.cmhc-schl.gc.ca/publications/en/rh-pr/tech/98109.htm)
- Spray applied foams that meet ICC ES AC 377 including:
    - 2-part open cell polyurethane foam (0.5pcf),
    - 2-part medium density closed cell spray polyurethane foam (2.0pcf)

5.2. SEALANTS

All caulking materials must be rated for a minimum 20-year life. Acceptable sealants used to join materials and block airflow include:

- Foam sealants that meet ICC ES 377 and ASTM C1642-07 such as:
    - 1-part urethane foam, low CFC (e.g. Great stuff, Pur-fil, Insta-foam, or equivalent)
    - 1-part urethane fire-block foam rated for sealing gaps in wood fire blocking
    - 2-part urethane foam kits 1.75pcf density, 2-part Flame Spread 25 foam kits 1.75pcf
- Siliconized latex sealants meeting ASTM C834,
- Silicone, 1-part gun grade urethane and other elastomeric sealants meeting ASTM C 920, (“Silicone” refers to 100% silicone caulk, clear or pigmented—not acrylic)
- Water based duct sealant meeting UL 181A-M, UL 181B-M ("RCD #6" or equivalent)
- Sealants rated for contact with chimneys and combustion vents such as:
    - Non-combustible fire barrier caulk or furnace cement meeting ASTM E 136
    - Silicone high temp RTV listed for use on gas vents to 500 degrees F, meeting ASTM C920

5.3 WEATHERSTRIPPING

- Door, interior: Schlegel "Q-lon" strips, or equivalent other product approved by PA vendor.)
- Doors, exterior: Schlegel "Q-lon with carrier" or equivalent other product approved by PA vendor.
- Door sweeps will be aluminum & vinyl
- Weatherstripping will have a deflection range of at least 1/4". Weather-stripping will remain compliant in cold weather

5.4 ACCESSORIES AND MATERIALS RELATED TO ATTIC PREP

- Glass or mineral fiber insulation as a backer for other sealants, meeting ASTM 665,
- Backer rod (preformed closed cell foam rope) as a backer for other sealants,
- 6 mil (0.l50 mm) polyethylene sheet (used for ground cover or winter-warm side application only)
- Moisture permeable air impermeable wrap material, flame spread 25 (cold side cover),
- Foil/scrim/kraft facing ignition barrier per IRC 2009 R316.5.3
- Netting to hold blown insulation in open cavity,
- FSK or vinyl faced duct wrap insulation R-8 nominal 3” meeting ASTM C1290, and C1136 (facing)
- Soffit ventilation air chutes for 16 or 24 inch rafter spacing ventilation air chutes must extend over existing insulation,
- Insulated flex duct 4 and 6 inch diameter for exhaust fans (no tape, use 4 zip ties)

5.5 INSULATION MATERIALS

- Cellulose (blown-in) loose fill insulation meeting ASTM C739, 16 CFR 1209, 1404,
- Specific Cellulose ICC ES reports required for fire rated details (e.g. ESR-1996 US Greenfiber, ESR-2217 NuWool),
- Mineral fiber batt and blanket insulation meeting ASTM 665,
- Mineral fiber (blown-in) loose fill insulation meeting ASTM C764,
- Fiberglass wool engineered for resisting airflow to less than 3.5cfm/sq ft @50pa, and tested to ASTM C522 (e.g. JM Spider, Knauf Perimeter Plus)
- Rigid closed cell foam boards meeting ASTM C578, ICC ES AC12,
- Specific foam board ICC ES reports required for uncovered use (e.g. NER-681 Thermax,

Rigid Fiberglass faced insulation boards meeting ASTM C553, C612, and C 1136 for facing

6.0 INSTALLATION

6.1 AIRSEALING

Installation of air sealing materials shall follow the manufacturers' instructions, Massachusetts Building Code (780 CMR), and all other appropriate codes.

Prior to installation, test results shall be provided to PA vendor in ICC ES reports or UL listed detail where specific testing is required by code for a specific use. (For example, low density foam left exposed in an unoccupied attic space, cellulose fiber installed as an air retarder and fire-stop in a rated wall between units.) Approval by the local code authority having jurisdiction must be obtained in writing prior to installation for uses beyond the specific listing.

6.1.1 Performance Criteria

CONTRACTORS will clearly define where the pressure and thermal boundaries of the home are to be, and insure that access hatches, framing voids and chimney, plumbing and wiring chases between the conditioned space and unconditioned attics, knee walls and other buffer zones are tightly sealed.

Air sealing measures at all openings between intact building materials shall be continuous, durable, able to support all expected loads and impermeable to airflow as indicated by chemical smoke at a pressure difference of 50 Pascals.

6.1.2 Conditions for Materials Use

a. Air impermeable barrier materials and sealants shall be used within their listing and installed in conformance with all applicable codes and manufacturer’s recommendations.
b. Sealant materials applied to exposed joints in interior or exterior finish shall meet all performance requirements, blend in with adjacent materials, and be acceptable to the owner.
c. Backing shall be provided for any sealant installed in gaps wider than 3/8” whether exposed or covered and all joints shall be tooled.
d. Rigid barriers shall be cut to friction fit openings with gaps not more than 1” for foam sealant and extra material on edges for fasteners.
    I. Support shall be provided to prevent sagging.
    II. Larger enclosures of rigid foam or fiberglass board barrier material for pipes,

whole house fans, or fold down stairs shall be fastened and sealed at all edges with weatherstrip provided at operable joints and edges sealed to the substrate where fixed.

e. Only non-combustible rigid barriers such as sheet metal or cement board shall be used to bridge the clearance space to heat sources such as chimneys and metal combustion vents. Rock wool may NOT be used.
f. Only non-combustible sealants such as furnace cement or E 136 rated caulk shall contact solid fuel chimneys or oil vents; for gas vents high temp (500 F, 600F) silicone RTV approved for gas vents may be used to seal the gap between the rigid barrier and heat source.
g. In addition to the airtight non-combustible barrier and seal at the opening, a clearance dam is required to maintain 3” or greater clearance around the chimney or vent for the full height of the insulation. Unfaced mineral fiber meets this criteria but a folded metal collar 2-4” taller than the final height of the insulation, folded into the vent to close the top space and fastened at the bottom and vertical seam is recommended.
h. A minimum 6" clearance to single walled metal flue pipes shall be maintained to comply with BPI standards and code requirements. This includes kitchen exhaust ducts.
i. 1 part sealant foam is listed for sealing gaps and annular spaces around penetrations of up to 1-5/16” in width and 1.5” full depth of wood plate for firestop. *Firestop foam is combustible and not allowed for use in contact with heat sources.*
j. 2-part sealant foam requires backing for openings from 2” to 4” wide and infill of rigid barrier material for openings wider than 4”
k. Insulation must be kept 3” or more away from the sides of a non-IC rated recessed light fixture (including any wiring box or ballast) and no insulation is allowed above the fixture. Unless contractor provides the PA vendor signed documentation by a licensed electrician, all recessed fixtures shall be treated as non-IC rated. (PA vendors that allow different treatment for IC rated fixtures will provide additional requirements for treatment and documentation.)
    i. If an air tight box is installed to limit air leakage, it shall be sized for clearance from the fixture, taller than the adjacent insulation and with a non-insulating moisture permeable top of gypsum board or equivalent material.
    ii. If access does not allow installation of the box, 3” clearance from insulation is still required with no insulation allowed above.
    iii. The gap between the fixture and ceiling may be sealed with fire rated caulking.
    iv. For air tightness and insulation continuity, replacement with an airtight IC rated fixture or infill of the opening and replacement with a flush mount fixture are preferred recommendations.
l. Dimensional limits:
    i. Siliconized acrylic shall not be used in openings or cracks over 3/16" without a backer, and generally should not be used in openings or cracks more than 3/8".
    ii. Pure silicone shall not be used in openings or cracks over 3/8" without a backer, and generally should not be used in openings or cracks more than ½".
    iii. Foam shall not be used to span gaps or openings more than 1 ½" without a backer material.
m. Flexible air barrier or other sheeting materials approved for air sealing use shall not span gaps larger than 24” without the use of framing for support.
n. Foam sealant will not be used where exposed to sunlight or other ultraviolet sources. It will not be used near any heat producing device unless a clearance of 3” can be

maintained for double walled flue pipes and masonry chimneys, and 6" for single walled flue pipes.

6.1.3 Typical Air Sealing Locations

In every specified work area: locate, uncover and seal all building air leakage pathways between conditioned and unconditioned areas, as defined by each PA vendor.

These areas can include accessible attics, side attics, crawlspaces, unconditioned basements, attached garages, and leakage from basement to outside; gaps, penetrations and fixture openings that allow interior air into inaccessible roofs, slants and outside wall cavities; and major direct openings between conditioned space and outside.

Basements are typically semi-conditioned spaces. Air sealing between the basement and the living space is not warranted in the scope of work when basement has been determined to be outside the conditioned space.

6.1.4 Common air leakage details include but are not limited to:

- Dropped soffits, dropped ceilings and ceiling height changes
- Plumbing wet walls, duct chases, duct seams, joints and boot leaks
- Chimney and combustion vent chases
- Openings behind and under tubs, showers, and tub/shower enclosures
- Wall tops open into attic, gaps between gypsum ceiling and wall plates
- Annular space at wiring, pipe penetrations through plates, and at ceiling fixtures
- Floors open under kneewalls, walls open at level changes and gable ends
- 2nd story floors open to attached roofs over porches and additions or garages
- Inside framing open into attic stairs and landings,
- Pocket door framing open into floor above and exterior walls
- Seams and openings in walls and ceilings between attached garages and house
- Non-IC recessed light fixtures
- Bath and kitchen fans venting into the attic
- All joints seams and penetrations in surfaces without an air retarding membrane
- Gaps in tongue in groove paneling where angles change at hips, valleys, and where walls meet slants and ceilings.
- Acoustical tile and suspended ceilings with no gypsum
- Missing gypsum behind decorative ceiling light trays; built in cabinets in kneewalls
- Missing gypsum or open joints above decorative ceiling beams
- Gaps below baseboard and behind carpet nailing strip at subfloor joint to exterior wall
- Common wall openings between dwelling units
- Attic access openings, operable doors and hatches without tight weatherstrip
- Pull down attic access stair covers
- Rim joist junctions and gaps between sill and foundation.
- Utility penetrations and direct openings through foundation walls
- Openings in gypsum board above suspended ceiling and behind cabinets
- Openings between window and door assemblies and their respective jambs and framing

6.1.5 Confirmation of Air Sealing Effectiveness

Confirmation that air sealing is continuous across all openings in a specified area shall be

performed by visual inspection of air leakage locations, and one of the following methods:

- Visual inspection aided by a chemical smoke test during blower door operation,
- Whole building air leakage test.
    - Whole building air leakage test results as specified by PA vendor. The air leakage test shall be made following equipment manufacturer's instructions and in conformance to Standard CAN/CGSB 149.10-1986, ASTM E-1827-07, or ASTM E-779-03,or
- Infrared inspection of the area aided by blower door operation.
    - When performed on a specified area or whole house, infrared inspection shall be done when there is a 18° inside to outside temperature difference in accordance with ASTM C1060 (1997) and air leakage pathways determined using ASTM E1186 (2009).

6.2 DUCT SEALING/ DUCT INSULATION

Duct sealing and insulation improvements are currently approved measures through the Mass Save program. **See Appendix 16.5 for airflow testing guidelines**.

6.2.1 General

Duct sealing has many benefits including the potential to improved comfort, indoor air quality and better humidity control. Unlike a house or building, there is no lower boundary of air tightness for a duct system. When sealing ducts, it makes the most sense to seal leaks close to the air handler where the pressure is greatest first and then work to the extremities of the system. Any un-insulated section of the duct system located in unconditioned space should be insulated to current code requirements. Ducts should be sealed before being insulated. Existing duct insulation may be carefully pulled back using the procedure described in section 6.2.6 #6 to expose connections and joints that may then be sealed with duct mastic.

6.2.2 Locations and Use

For energy savings, only duct systems 30% or more in unconditioned space (measured by linear feet of ducts) should be evaluated for duct sealing and insulation. When assessing existing duct systems, ducts located in semi conditioned spaces like basements have proven to have marginal payback. Therefore it makes the most sense to seal ducts that are located in ventilated spaces such as attics and open crawl spaces, once the decision is made to seal a duct segment, all the openings in the duct system should be sealed using program approved materials.

6.2.3 Duct Sealing Materials Requirements

The following materials are approved for duct sealing:

1. Water based (latex) mastic conforming to UL-181A-M
2. Tapes listed and labeled in accordance with UL-181A-P for pressure sensitive or UL-181A-H for heat sensitive tape UL-181B-M.(Example: BUTYL mastic tape)
3. Aluminum Foil Tape (for use with metal duct work to plenum connections).
4. 2” roll mesh tape.(For openings in the duct system greater than ¼”)

6.2.4 Duct Sealing Installation Requirements

1. All joints, **seams** and connections should be sealed with duct mastic or approved duct sealing tape when no duct Insulation is present or will be removed and replaced as part of the work scope.
2. All connection points and joints should be sealed when insulation is present. **Seams located along the edges of the duct work will not be required to be**

sealed due to existing insulation barrier.

3. Any seam or hole in the duct system greater than ¼" will be backed with mesh tape and sealed with duct mastic.
4. Flex duct connections should be made with hard duct connectors, held in place with a vinyl tension strap. The connection between the inner liner and the hard duct it is connected too should be sealed with duct mastic.
5. Filter Slot door, should have an operable door that closes securely and is reasonably tight. If present filter slot does not have a door or one that will close properly than Aluminum tape should be used as a temporary blocker and the customer should be notified to install a more permanent solution.
6. Boot to floor, wall or ceiling connections for supplies and returns should be treated as part of air sealing work scope.

6.2.5 Duct Insulation Materials Requirements

1. Duct wrap with an R-value of 8 will be used to insulate ducts located in unconditioned spaces.
2. Tape made specifically for use on duct insulation (e.g. FSK Facing Tape, Aluminum Foil/Fiberglass Scrim on Polyethylene Coated Kraft Paper).
4. Plier stapler and staples
5. 10-14" cable (zip) ties

6.2.6 Duct Insulation Installation Requirements

1. Duct insulation will be installed by wrapping insulation around ductwork and attaching neatly using a plier stapler. Two inches should be added to the width of the duct wrap to provide the excess wrap needed to create a neat tight seam that can be stapled without compressing the insulation. Do not pull the insulation too tight as this will compress it and decrease its R-value. Seams should be stapled every two inches at most
2. No fiberglass will be left exposed. All seams and tears in the vinyl vapor retarder will be sealed using program approved tape (FSK Facing Tape, Material Aluminum Foil/Fiberglass Scrim on Polyethylene Coated Kraft Paper).
3. Flex duct insulation connections should be made with hard duct connectors, held in place with a vinyl tension strap.
4. No part of the duct system will be left un-insulated, including supply and return boots.
5. Floor joist bays used as return ducts will have duct insulation wrapped around 3 sides and secured near the top of each joist or to the subfloor on each side. Duct insulation must be in substantial contact with all sides of duct area.
6. **Systems with existing insulation** should have the insulation peeled back to expose connections and joints only. Joints and or connections occur wherever two pieces of duct were connected by installers. Joints and or connections in straight duct can be located by compressing the duct insulation until joints are felt. Once they are located the insulation should be cut neatly and peeled back far enough to expose the joint for mastic application. Once the ducts have been sealed, the duct insulation should be replaced back in its original location with no voids in insulation coverage. All insulation that was cut should be put back in place using approved tape to seal area that was opened to expose the connections or joints. If insulation was removed completely to better access joints and connections then additional materials such as cable (zip) ties or staples should be used to additionally support insulation to prevent insulation from becoming disengaged from ducts.

6.3 ATTIC INSULATION

Installation must meet or exceed the Massachusetts State and Local Building Codes.

Criteria for the installation of insulation include but are not limited to the additional standards set forth below.

6.3.1 Attic Air Sealing Confirmation

Before insulating the attic, the CONTRACTOR will confirm that all bypasses at chimneys, soil stacks, perimeter walls, dropped ceilings, kneewall floors and wall openings, non-IC recessed light enclosures, other attic air sealing is complete per section 6.1 above. If these areas are not properly sealed, CONTRACTOR must notify program to determine next steps before proceeding.

Recessed light fixtures shall be protected from contact with insulation as noted in section 6.1.2.k.

6.3.2 Attic Preparation

Confirm attic prep per ASTM C1015-06 and MA Basic Insulation Authorization including:

a. Clearance dams that maintain 3" space confirmed installed at all masonry or double walled metal combustion venting systems. Clearance dams must maintain 6" space confirmed installed at all single wall pipe combustion venting systems.
b. Clearance dams installed at attic access, bath fans, air handlers and between blown and storage areas.
c. Permanent damming shall be installed around all attic hatch covers in a manner that will not interfere with the opening of the hatch cover, and that when opened will prevent insulation from falling into the living area, and that will allow safe access into the attic.
    i. The dam shall be made of ½" thick or greater wood and be tightly sealed at the base and seams, or fiberglass batt laid flat on all four sides around the hatch, or other materials approved by PA designee.
    ii. Insulation surrounding the dam must equal the R-value of the rest of the attic space;
    iii. Insulation should not taper to the damming or be less because of the height of the dam.
d. Install vent chutes at all soffit vents and provide wind baffles or block under chutes,
e. Ensure that all exhaust equipment ducting is terminated to the outside of the structure.
f. Provide insulation thickness markers 1/300 sq ft for open blow area.

6.3.3 Attic Access Doors

a. Insulate and tightly weather-strip all attic access doors.
b. Fasten rigid insulation to access hatches. If infeasible, fiberglass batts may be used.
c. Provide minimum R-14 to hatches and R-10 enclosure at pull down stairs (with air seal gasket, (e.g., insulated attic stair cover) and behind walkup doors.
d. Rigid foam used shall be rated for exposed use in attics on ICC ES report, and meet Sections R-316.5.4 and 316.6 requirements of IRC 2009.
e. Provide latch, hook fastener, or other mechanical closure on vertical access doors to keep them tight against weatherstrip when closed.

6.3.4 Attic Venting

a. Provide attic venting per code if included in the approved Scope of Work.
b. Provide access openings to inaccessible attics where feasible.

6.3.5 Flat Attic Insulation

a. Blow in attic insulation level over entire area specified at the depth required to give the required settled R-value.

b. Use the number of bags to meet listed coverage per manufacturers' specifications.
c. Provide attic information card per ASTM C1015-06 and 16CFR 460 requirements.
d. The program will provide a form which the installer must sign, date and post in an easily visible location (on the electrical panel or a framing member adjacent to the attic access) showing the following information:
    i. Insulation material installed,
    ii. Installed thickness,
    iii. Coverage area,
    iv. Installed R-value,
    v. Number of bags used or pounds installed per FTC Rule 16 CFR 460.

6.3.6 Sloped Ceiling Insulation

Sloped ceilings (between kneewall and upper attic flat) may be dense packed per section 6.5.3 using cellulose.

6.3.7 Open Cavity Insulation

a. Install mineral fiber batt or blanket insulation in all open wall cavities or open floors to R- value in work scope.
b. Installation of blanket or batt insulation shall conform to ASTM C1320 with cavities completely filled with no voids, gaps or compressions.
c. Batt insulation MUST always be installed in full contact with the warm side air barrier.
d. Batt insulation installed in walls MUST always have a solid air barrier on all six sides of the cavity when access allows.
e. Batt insulation with a kraft or foil covering must be "face stapled" to the framing or friction fit.
f. Loose fill insulation (cellulose or mineral fiber) is allowed in open walls, floors open to below, when sprayed in or blown behind netting, rigid foam, drywall, or other barriers.

6.3.8 Rigid Foam Board

Where rigid foam board is installed over mineral fiber batt insulation or on another attic surface, use foam board listed for uncovered use in attic. As an alternative, install a thermal barrier or prescriptive ignition barrier per IRC 2009 R316.5.3 and MA code. In all cases follow manufacturer's installation requirements.

6.3.9 Floor Blocking

Where present, the kneewall floor joist opening from the attic floor to conditioned space under the kneewall shall be blocked airtight with a barrier sealed in place below the interior face of the kneewall.

6.3.10 Dense Pack Floor Insulation

At floored areas inaccessible to air sealing using barrier materials, CONTRACTOR shall densepack to retard airflow. Acceptable materials include:

a. Cellulose insulation at 3.5 lbs/cu ft or greater density;
b. Fiberglass wool tested for air resistance at 2.2 lbs/cu ft or greater density. If fiberglass wool is used, a product information cut-out from the bag must be included with the certificate to verify that material was tested to ASTM C522.

Methods can include lifting one floorboard to gain access to each cavity and inserting a 2 to 2-1/2" insulation hose into the floor for faster production. Material use shall be confirmed to

match bags used per unit area to achieve density targets.

Flooring that has been removed for access to install insulation shall be replaced to match original site condition. Flooring that has been drilled shall be repaired with wooden plug matching the hole diameter and set flush to the top of the floor.

6.4 ATTIC VENTING

6.4.1 Provide attic venting per code with roof, soffit, gable, ridge vent or a combination.

6.4.2 Follow all manufacturer's instructions and applicable codes. Flash properly, seal and fasten to maintain roof and cladding drainage.

6.4.3 CONTRACTOR shall provide documentation showing the manufacturer's net free air rating for any products used.

6.5 CLOSED SIDEWALL INSULATION

6.5.1 Performance criteria

In existing closed cavities where air sealing is not feasible, densepack insulation into every cavity to prevent settling with no voids or escape routes for heat and get an extra benefit of reduced hidden airflow and protection that wraps around the whole house and connects to the airtight attic.

6.5.2 Pre-Work Inspection Criteria

Pre inspections are to be performed in compliance with ASTM C 1015 and MA Insulation Authorization. Inspect all walls for pre-existing hazards including:

- Moisture entry and buildup,
- Weak or damaged interior finish materials,
- Hazardous wiring
- Potential heat sources in or adjacent to wall cavities.

Confirm that cavities are intact and openings into the house are blocked.

6.5.3 Wall Insulation Procedure

a. Gain access to every wall cavity.
b. Pack insulation uniformly into all corners.
c. Confirm the number of bags and pounds of material used for a specified area of 4" wall cavities is consistent with:
    i. 3.5 lbs/cu ft (1lb/sq ft) for cellulose, or
    ii. 2.2lbs/cu ft (0.6lb/sq ft) for fiberglass wool tested for airflow resistance per ASTM C 522.
d. Repair holes that have been drilled.
    i. Interior holes shall be plugged and an initial coat of suitable patching material shall be applied.
    ii. Exposed exterior holes in wood siding shall be made weather tight with a wooden plug and patched with exterior grade filler.
    iii. Hidden holes (beneath siding) shall be plugged and covered to make the existing drainage plane and other weather barriers complete.

6.5.4 Wall Cavity Confirmation

Confirm cavity pack is effective and the machine adjustment is within limits by:

a. Testing airflow at 50 pa with smoke at a completed but uncovered installation hole, or
b. Testing airflow with chemical smoke at first application hole in completed cavity while blowing adjacent cavity.

6.5.5 Inspection

a. Void areas greater than 10 sq. ft. per 1000 sq. ft. of achievable wall area, as determined by Program quality assurance procedures, shall be filled by the CONTRACTOR at no additional cost to the homeowner or the program. When instructed to do so by the Program inspector, the CONTRACTOR will contact the customer to correct job deficiencies within 14 days of notification.

6.6 FLOOR INSULATION

Floor systems that are determined to be the thermal boundary will be insulated and air sealed in accordance with Massachusetts Building Code and Mass Save Application Details.

6.6.1 Performance criteria

An air barrier shall be created across subfloor by sealing large gaps and openings including any ducts in unconditioned space. Floor insulation shall cover all exposed subfloor to level specified for as continuous a thermal barrier as possible.

6.6.2 Preparation

a. Air sealing of a crawlspace or basement ceiling shall be performed per section 6.1 above and the MA Basic Air sealing Authorization.
b. Inspection before installation shall be made in conformance with ASTM C1320-09.
    i. Inspect the attic, crawlspace, or other area to be insulated, postpone installation until:
        - Potentially faulty wiring is corrected and confirmed OK by a licensed electrician
        - Moisture damage and/or entry is corrected and sources controlled
        - Ground cover is in place over exposed soil in crawlspaces wherever accessible. Uncovered conditions must be disclosed to customer.
            - o If an accessible dirt floor area is vented per code, a vapor barrier is still recommended.
            - o If a dirt floor area is deemed inaccessible AND insufficiently vented, then sufficient ventilation must be added OR the crawlspace must be made accessible, UNLESS the exposed dirt floor comprises less than 10% of the total footprint of the building.
        - All openings allowing air between conditioned space and attic are sealed
c. Confirm that caulk, gasket, or other sealant is installed at penetrations of the interior wall or floor including plumbing, electrical, heat registers, and grills.

6.6.3 Installation

a. Installation of mineral fiber batt or blanket insulation in open cavities shall be made in conformance with ASTM C 1320 and MA code. Exception, facing if any shall be in direct and complete contact with interior surface - no inset stapling allowed in floor.
b. Installation of cellulose or fiberglass blowing wool into closed cavities shall be made in conformance with attic floor insulation methods above 6.3.11 or wall insulation in 6.5.
    - Access shall be gained into every cavity with least damage possible and lead

safe process in place for painted surfaces in homes built prior to 1978.

- material use per unit area shall match weight required to give target densities of 3.5lbs/cu. ft. for cellulose and 2.2lbs/cu. ft. for fiberglass wool tested for airflow resistance

c. Install batt or blanket insulation to:
   - Maintain 3" clearance from non-IC rated lights and heat sources, none placed above
   - Completely fill every cavity to required depth or more
   - Where double layers are installed over floors, cross the layers with no gaps between layers

d. Where batt fiberglass is installed beneath floors, insulation shall be in full contact with floor above using wire, screen, nylon mesh fastened in place
   - Fit to length and placed snug to edges without gaps, voids or compressions
   - Cut and fit around all cross-bracing, outlets, wiring, into narrow cavities
   - No exposed facings rated higher than flame spread 25 left
   - Where vapor retarder is installed, place to warm-in-winter side
   - Never place insulation between piping and the warm surface, to prevent freezing.

6.6.4 Rim Joist Insulation

a. **Fiberglass Insulation** – When joists are spaced appropriately, recommend fiberglass insulation for the rim joist area in basements that are within the thermal envelope. A recommendation to air seal the rim joist must be made in conjunction with fiberglass batt insulation to provide an aligned air barrier and thermal boundary.

   Spray Foam Insulation – Check with your PA for materials used.

   Thermal Barrier Board – Can be recommended in special circumstances. Check with your PA for appropriate situations.

b. CONTRACTOR will confirm no insulation is placed between piping and the warm side of the rim joist framing to prevent freezing.

6.7 FOUNDATION INSULATION

When approved within the scope of work, foundation walls that are determined as the thermal boundary may be insulated to a minimum of R-10 and be sealed as defined in the air sealing section of this document. Prior to application, confirm that roof runoff, surface water, and ground water are drained properly.

6.7.1 Performance criteria

Basement or crawlspace shall be brought inside the thermal/pressure boundary by installing rigid insulation at inside of foundation wall, sealed from subfloor to below grade.

6.7.2 Preparation

Primary air leakage shall be substantially reduced by sealing gaps at the rim joist, sill and surface of the foundation wall.

6.7.3 Installation

a. For basements attach R-5 or higher foil faced isocyanurate board listed for

uncovered use to foundation wall, full height; and cut pieces to fit into rim joist and across sill. Seal gaps in foam board edges at rim and sill; and tape seams in foam board on wall

b. For crawlspaces attach R-5 or higher XPS rated for uncovered use in crawlspaces to foundation wall, to 24 inches below grade; and cut and fit pieces to fit into rim and across sill. Seal gaps in foam board edges at rim and sill and tape seams in foam board on wall.
c. If XPS foam board is installed in a basement beyond the listing for uncovered use, follow a. and cover foam with thermal barrier

6.8 WEATHERSTRIPPING

Approved window weatherstripping shall be attached as per manufacturers' instructions to meeting rail, sill & sash channels. (Note: if applicable, PF-524-AB may be stapled to the sash itself instead of sill & sash channels.) Door weatherstripping installed on interior of doors will be stapled to top and both sides of door. Approved door sweeps shall be attached as per manufacturers' instructions to bottom of door.

7.0 WINDOW REPLACEMENT

Windows shall be installed according to manufacturer's instructions to assure proper operation and moisture protection. Rough openings shall be air sealed to be air tight prior to installation of casings and sills. Newly installed windows shall be inspected and verified for proper operation of all hardware and locking mechanisms.

Refer to EPA guidelines and local codes for requirements for retrofit window installations in locations where lead and/or asbestos may be present.

8.0 HEATING SYSTEM REPLACEMENT

The furnace or boiler that is to be installed must meet the minimum AFUE ratings set by the Mass Save program. Installation is to be completed in accordance with the manufacturers' instructions while following the State and Local Codes. Any questions should be communicated with the PROGRAM and/or Authority Having Jurisdiction.

9.0 AIR CONDITIONING SYSTEM MEASURES

The air conditioning system that is to be installed must meet the minimum energy ratings set by the Mass Save program. Installation is to be completed in accordance with the manufacturers' instructions while following the State and Local Codes. Any questions should be communicated to the PA vendor and/or Authority Having Jurisdiction.

10.0 MECHANICAL VENTILATION

Contractor is responsible for ensuring that the house meets BPI standards for fresh air ventilation.

11.0 LIGHTING MEASURES

The lighting unit that is to be installed must meet the maximum energy use set by the Mass Save program. Installation is to be completed in accordance with the manufacturers' instructions and fixture restrictions.

12.0 DOMESTIC HOT WATER MEASURES

The domestic hot water unit that is to be installed must meet the minimum Energy Factor ratings or energy efficiency ratings set by the Mass Save program. Installation is to be completed in accordance with the manufacturers' instructions while following the State and Local Codes. Any questions should be communicated with the PROGRAM and/or Authority Having Jurisdiction.

13.0 QUALITY ASSURANCE

Quality Assurance (In-field Quality Assurance Inspections)

Customer Discussion
Visual Inspections and Diagnostic Tests
Inspection Documentation
Contractor Follow-up

The program has the goal of performing on-site in-process and post installation quality assurance inspections where major measures have been installed.

Any issues identified during on-site inspections will need to be successfully addressed prior to release of CONTRACTOR payment.

Contractor Evaluation

CONTRACTORS will be evaluated on an ongoing basis throughout the Program Year based on work quality, customer service, and quality of program documentation. CONTRACTORS should expect random and unannounced quality control evaluations on a minimum of 10% of their jobs. This is in addition to the standard Final Inspections performed on all work. Evaluations will be performed by Final Inspectors, Field Supervisors, Program Managers, and/or the Quality Control Department, using a standard evaluation format (see Evaluation Form Attachment).

CONTRACTORS who repeatedly perform poorly on evaluations, and CONTRACTORS who repeatedly receive fails (excluding Assessor fails) on jobs, are subject to probationary actions and additional training as determined by the PA Vendor. CONTRACTORS who fail to improve after their probationary period are subject to suspension and/or termination as UTILITY Approved CONTRACTOR.

In addition, CONTRACTORS who repeatedly fail to meet timelines, generate an undue number of CUSTOMER complaints, and fail to adequately fulfill warranty obligations are eligible for suspension and/or termination.

14.0 Program Sponsors

Berkshire Gas
Cape Light Compact
Columbia Gas of Massachusetts
Eversource
Liberty Utilities
National Grid
Unitil

15.0 REFERENCES:

Documents Published by the Canadian General Standards Board (CGSB)
Place du Portage, III, 6B1Gatineau,
Québec, K1A 1G6 Canada
Telephone: (819) 956-0425; Fax: (819) 956-5740; www.pwgsc.gc.ca/cgsb
CAN/CGSB 51.71-2005 Depressurization Test

Documents Published by the National Fire Protection Association
(NFPA) 1 Batterymarch Park
Quincy, MA 30169-7471
Telephone: (617) 770-3000; Fax: (617) 770-0700; www.nfpa.org
NFPA 54-2006, ANSI Z223.1-2006 National Fuel Gas Code

Documents Published by the International Code
Council 500 New Jersey Avenue, NW, 6th Floor
Washington, DC 20001
Telephone (888) 422-7233; Fax: (202) 783-2348; www.iccsafe.org
International Residential Code - 2006

16.0 INFORMATIVE APPENDICES

16.1 Health and Safety Guidance
16.2 Contractor Performance Standard
16.3 K &T Form 2008
16.4 Application Details
16.5 Duct Sealing and Duct Insulation Guidance

These Appendices provides general information about safety issues for the Contractor and homeowner, as well as sample documentation that contractors may use.

APPENDIX 16.1
HEALTH AND SAFETY GUIDANCE

ASBESTOS

Health/Safety Concerns: The US Environmental Protection Agency's description is: "The most dangerous asbestos fibers are too small to be visible. After they are inhaled, they can remain and accumulate in the lungs. Asbestos can cause lung cancer, mesothelioma (a cancer of the chest and abdominal linings), and asbestosis (irreversible lung scarring that can be fatal).
Symptoms of these diseases do not show up until many years after exposure began. Most people with asbestos-related diseases were exposed to elevated concentrations on the job; some developed disease from exposure to clothing and equipment brought home from job sites."

Sources in Homes: Until its use was strictly limited in the 1970s asbestos was used in a large number of building products. The most common applications that could involve interaction with weatherization personnel include:

- Boiler insulation
- Furnace insulation
- Steam boiler insulation
- Pipe insulation
- Duct insulation
- Asbestos cement sidewall shingles
- Vermiculite insulation
- Floor tiles (9x9)
- Acoustical

materials To

minimize exposure:

- Learn to recognize suspected asbestos containing materials. (Joints look like a plaster cast.)
- Avoid disturbance of possible asbestos containing material that is friable. Friable asbestos is "any material containing greater than one percent asbestos by weight or volume that hand pressure can crumble, pulverize or reduce to powder when dry, or any asbestos containing materials that can reasonably be expected, as a result of the demolition or renovation to be undertaken, to become pulverized through breaking, chipping, crumbling, crushing, or other means of rendering fibers available to the ambient air."
- DO NOT CONDUCT A BLOWER DOOR TEST ON A BUILDING WHERE **FRIABLE** MATERIALS SUSPECTED OF CONTAINING ASBESTOS IS PRESENT. In the case of Steam boilers with radiators, asbestos may still be in wall cavities.
- When Asbestos Cement sidewall shingles are removed and reinstalled as part of a wall insulation procedure, the CONTRACTOR must complete the work in compliance with the requirements of the Massachusetts Department of Environmental Protection.

This information is a general program guidance for Weatherization personnel and does not provide the detailed specifications for the proper handling of possible asbestos

containing material. State law concerning asbestos abatement can be found in Commonwealth of Massachusetts Department of Public Health Asbestos Abatement Regulation; CMR 410.353 and 453 CMR 6.00, THE REMOVAL, CONTAINMENT OR ENCAPSULATION OF ASBESTOS
(http://www.alewife.org/asbestos/453cmr6.txt)

LEAD

Health/Safety Concerns: Ingestion or absorption of lead into the blood stream is a serious health hazard causing brain damage over a period of time. This can be a particularly serious problem with small children, who may ingest paint chips or flakes, or dust contaminated with lead products.
Serious learning disabilities can result from excessive lead levels in the bloodstream. Workers can be contaminated in the same way as children, but are most likely to be exposed by breathing dust contaminated by sanding or planning surfaces that contain lead based paints.

Sources in Homes: Lead paint is the primary source of lead in a home that was built prior to 1978, when lead became prohibited as an ingredient in paints. Contamination occurs when lead paint is disturbed by drilling, sanding, chipping, or flaking. Lead is also present in the solder used in plumbing pipe joints. Lead can leach into potable water, particularly when water is stagnant in the pipes for a length of time. To a lesser degree, lead contamination can result from inks used in newspapers and magazines.

To minimize risks to CUSTOMERS and Weatherization personnel:

DO NOT DISTURB LEAD PAINT UNLESS ABSOLUTELY NECESSARY AND THEN ONLY BY INDIVUALS CERTIFIED TO COMPLETE WORK USING LEAD-SAFE PROTOCOLS.
CONTRACTORS should assume that any paint on windows and doors in homes built before 1978 contains lead unless it has been verified otherwise. **WHEN THERE IS A POSSIBILITY OF DISTURBING LEAD DURING THE WEATHERIZATION PROCESS, CONTRACTORS MUST COMPLETE THE WORK IN A LEAD-SAFE MANNER IN ACCORDANCE WITH EPA AND MASSACHUSETTS DIVISION OF OCCUPATIONAL SAFETY REGULATIONS.**

Worker Protection: Detailed specifications regarding the health and safety of workers in the construction industry can be found in Construction Industry OSHA Safety and Health Standards (299CFR 1926/1910) and the specific worker safety requirements in the EPA's "Lead; Renovation, Repair, and Painting Program" (LRRPP) Final Rule. **Also refer to Section 5.13 Lead- Safe Weatherization within the Northeast Weatherization Field Guide.**

ALL CONTRACTORS WORKING IN THE MASS SAVE PROGRAM MUST RECEIVE LEAD- SAFE WEATHERIZATION TRAINING, BECOME CERTIFIED PER USEPA REGULATIONS, AND FOLLOW ALL RELEVANT TECHNCIAL AND ADMINISTRATIVE PROCEDURES
pursuant to 40CFR Part 745.225.

LEAD SAFE WEATHERIZATION INFORMATION

EPA and Massachusetts Division of Occupational Safety are the guiding authorities for Mass Save work.

When Should Lead-Safe Practices be followed?

According to the U.S. EPA, Lead-Safe practices shall be followed when all three components of the following set of criteria are met:

1. The dwelling was constructed before 1978
2. The dwelling has not been determined to be lead-based paint free, and
3. Either, the amount of disturbed lead-based painted surface exceeds six square feet per room of interior surface or twenty square feet of exterior surface.

Renovation Notice About Lead Safety

Federal law requires that owners and occupants of a house or apartment built before 1978 receive the EPA pamphlet, "Renovate Right Important Lead Hazard Information for Families, Child Care Providers and Schools", prior to the start of the renovation work. A written notification of receipt from an adult resident of the home must be received. If this receipt cannot be obtained, this requirement can be satisfied by sending the occupant the pamphlet by certified mail with the receipt included in the client file.

Post Weatherization Cleanup

Clearance testing is not a requirement for weatherization work and is not an allowable expenditure of DOE funds. Cleanup at the completion of Lead-Safe Weatherization work requires the use of a HEPA vacuum, (a HEPA filter in a standard vacuum is NOT an acceptable alternative) wet cleaning methods, a visual inspection and the collection and disposition of any dust, debris or chips with the rest of the jobsite waste.

Certification

All Weatherization Contractors must complete an EPA approved Lead- Safety RRP training and certification prior to participating in the Mass Save program. Per USEPA requirements, a certified individual must be on site to ensure proper work.

Pollution Occurrence Insurance Coverage

The following is DOE's most recent guidance concerning Lead-Safe Weatherization. While many of the mandatory regulatory requirements do not begin until April 1, 2010, DOE considers this guidance a "Best Practice" for Lead-Safe Weatherization work and the techniques outlined must be used as a guideline for working safely in homes that may contain lead.

WIRING

Safety Concerns:

- Electric shock while working around wiring in all areas of homes.
- Fire resulting from arcing between loose wiring connections.
- Fire resulting from lack of dissipation of heat due to insulation around heat producing sources (i.e. recessed light fixtures).
- Integrity and safety of knob and tube wiring.

To Minimize Risk:

- Workers must demonstrate caution when working around wiring.
- Verify proper wiring connections and proper fusing.
- Verify proper blocking out of insulation around heat producing sources.

APPENDIX 16.2
CONTRACTOR PERFORMANCE STANDARD

The Performance Standards Subcommittee has developed a list of prerequisites that the group is proposing as a set of requirements for all Home Energy Services Program representatives to follow.

- Before Arriving On Site
    - Vehicle Identification Requirement - The company name should be included on all company vehicles.
    - Provide a confirmation to all customers before arriving on site. This could be an email, letter or phone call confirming the appointment.
- Crew Chief Requirements - Crew Chief should be the first and last interactions with the customer
    - Crew Chief should introduce himself/herself to the customer showing some form of identification: business card, ID badge or other identification that associates the Crew Chief as the Mass Save Participating Contractor. The Crew Chief should also be providing an overview of the work that is going to be performed and where they will be doing work.
    - At the end of each day, the Crew Chief should conduct a walk-through of the home making sure the customer is satisfied with the cleanliness of the home and to review the work completed. The Crew Chief should also provide a contact number for additional questions.
    - Crew Chiefs should inform the customer that they may request an Inspection of the work and may be contacted to participate in surveys or inspections following the completion of the work.
- General Contractor Crew Requirements
    - Smoking - Contractor should be out of direct sight of the customers. This could include smoking in the company vehicle, personal vehicle or across the street.
        - All cigarette waste should be properly disposed of and removed from the property each day.
    - Crew Clothing - Shirt and pants are required to be worn at all times while on site.
        - Shirt will not contain vulgar or offensive language/pictures.

- All clothing and general appearance should be representative of the high standards of the Mass Save Home Energy Services Program.

▪ Shoes

- Always comply with OSHA requirements for footwear.
- Follow customer's expectations for wearing footwear in the home, including:
  - Wearing booties to eliminate tracking dirt into house when necessary.
  - Properly protect travel areas from foot traffic.

o Ask homeowner for permission before using the restroom facilities.

o The crew should not eat food in the customer's home. The crew may eat in the driveway/truck and should clean up after themselves.

o Phone usage inside the home should be limited to work related calls only. Each company is responsible for maintaining their own employee requirements regarding phone use, but should not interfere with their work or customer service.

o Each member of the crew is expected to refrain from any language or actions that could be construed as offensive, harassing, intimidating, and/or demeaning while at a customers' property.

- Customer/Condition of House
  - o No trash will be left on property (neither inside nor outside home)
  - o Leave customer's property in the same condition as when the work started.
  - o No graffiti will be permitted on the customer's property at any time.
  - o Working Hours - Unless authorized by the customer, crews will work during normal business hours and all crews must follow all local ordinances
  - o Customers should not be in the general area when work is being completed.

APPENDIX 16.3
KNOB & TUBE WIRING

During the Energy Survey of your home, indications of "knob and tube" wiring were found. This old style of wiring involves individual wires that are run through walls and ceilings in a house, with ceramic "knobs" and "tubes" to prevent contact with wood framing. The knob and tube wiring that has been noted *may or may not appear to be active*. Even if the observed wiring appears to be inactive, there may still be active knob and tube circuits hidden inside walls or other inaccessible areas of the house.

Program guidelines require that you have the home checked by a licensed electrician and certified as being ***free of all active knob & tube wiring***, before insulation and/or air sealing work can be done. Your electrician should fill out and submit a copy of this document to Program Designee in order to verify the absence or inactivity of the knob and tube wiring in the areas of your home where we are proposing insulation to be installed. **Due to the liability involved in signing such a form, we suggest you show or describe this form to your electrician before hiring him to inspect your home to be sure he/she is willing to sign it.** Your home could benefit from insulation and/or air sealing in the:

- ☐ **Attic**
- ☐ **Walls**
- ☐ **Basement**

**** Only after this certification is received by Program Designee can a Contract be issued for energy saving insulation and/or air sealing work. ****

Electrician's Certification
(This form is invalid when any qualifications or alterations are added.)

Company Name & Address _____

_____

Electrician's Name _____ License # _____

I have performed an inspection of the wiring at the home of:

_____ at _____ in _____
(Owner's Name) (Street Address) (City)

Upon completion of my inspection I have found that there is no active knob and tube wiring in the area(s) noted below.

☐ Attic ☐ Walls ☐ Basement

Electrician's Signature _____ Date _____

APPENDIX 16.4

APPLICATION GUIDANCE

This Appendix is provided for additional guidance to the Contractor, and offers general information about materials and installation procedures. It is provided for informational purposes.

Caulks and Sealants

1. Locations and use of caulks and sealants are governed by cost-effectiveness standards and procedures. The proper caulk will be matched to the location where it is applied. Consideration will be given to durability, paintability, adherence, color, toxicity, flammability, etc.
   i. Siliconized acrylics will generally only be used in interior locations or where paintability is important. When used in visible areas, customer must approve the application, and see a sample before continuing. Clear acrylics, due to their shiny appearance, must be used only where appropriate, and should be approved by the customer prior to use in visible areas. Clear acrylics should be avoided where possible due to greater shrinkage.
   ii. Pure silicone will generally be used in exterior applications, unless paintability is needed. Pure silicone will be used anywhere that sealants are needed between wood and metal, wood and concrete, or other materials with differential expansion as moisture and temperature vary, or where greater flexibility is needed.
2. Caulking is performed on the interior of the dwelling for general air leakage and to prevent moisture penetration into wall cavities.
3. Caulking is performed on the exterior of the dwelling to prevent bulk moisture from entering the envelope of the building and to seal areas of air leakage.
4. When appropriate, windows will be caulked along the full perimeter of the interior (or exterior), including sill area, side stops, apron, and casings.
5. When appropriate, doors will be caulked along the interior (or exterior) casings and door jambs/stops.

Cellulose Insulation

1. Cellulose insulation from most manufacturers is available in at least two grades that are characterized by the fire retardant added to the insulation. The fire retardants are usually 1) a mix of ammonium sulfate and boric acid or 2) boric acid only (termed “borate only”). Mass Save currently accepts both grades.

Insulation Baffles

1. When soffit vents are installed or existing, baffles shall be installed in the space connected to the soffit vents in such a way that the top plate can be insulated. Where possible, a clearance of 2" from the top of the baffle to the underside of the roof sheathing shall be provided in accordance with local building codes. Blocking should be permanent, mechanically fastened at sides and at bottom, and ensure the free movement of air through soffit vents into the attic, but not allow the air to "wind wash" the insulation and reduce its effectiveness. It should be rigid enough to restrain loose-fill insulation from congesting the soffit vents at the eaves and obstructing ventilation.
2. Baffles should be installed per work scope. These should allow air to flow from soffit or kneewall area into peak. Baffles must be mechanically fastened at sides and at bottom and

be carefully fit with insulation packed in place at the bottom to prevent wind intrusion into or under insulation. Flexible Styrofoam baffles may be used for very low pitch roof areas.

Attic Access

1. When ready access to the attic is not available through an existing opening, access to attic areas should be gained from the exterior through attic vent openings when possible. If this is not feasible, then the following criteria shall be used for access openings:
   a. Surface Openings: Cut existing wall board halfway on two studs (preferably through a closet). When closing the opening, the new materials must be flush with existing wall material and taped and covered with one coat of joint compound.
   b. Plywood Openings: Cut existing wall between two studs. Close opening with 1/2 plywood (G1S/AC) with four (4) 1 1/2" x 8 flat head wood screws secured into studs.
   c. Finish Openings: Cut existing ceilings. Head off opening. Install 2 1/2 casing around rough opening. Allow a 3/8" reveal into opening to receive 1/2" plywood (G1S-AC) to complete opening. Plywood cover to be weather-stripped and insulated. Casing to be mitered neatly.

2. In attics with existing fiberglass batts, remove the batt in the last joist bay on any gable end or other perimeter configuration that runs perpendicular to strapping ends. This space should be dense packed with blown-in cellulose or fiberglass wool tested for air resistance to reduce cavity air movement at the inaccessible floor wall joint.

Attic Ventilation

1. Do not install insulation in an attic space unless adequate and permanent ventilation is installed.
2. Adequate cross-ventilation shall be maintained above all attic insulation by providing both low and high vents or gable end vents where possible. One square foot of net-free vent area (NFA) shall be provided for every 300 ft2 of attic area with 50 to 60% of the vent area located near the roof ridge and 40 to 50% located near the eaves. One level of venting may be used provided that adequate cross ventilation can be maintained.

NOTE: Although the use of window vents is allowed, the vents must be permanently fixed and must meet the minimum requirements for free vent area as noted above.

3. Ventilation should be improved wherever reasonable and practical to meet current code requirements when attic insulation is installed. The details of the types of vents and where they may be practically installed on each specific house varies. Consideration should be given to the type and location of vents to provide as much cross ventilation as possible for the specific application depending on existing conditions and retrofit options.

Sidewall Insulation

1. Pre-Installation Requirements: Prior to starting a job, an interior and exterior inspection must be conducted by Contractor to determine any potential problem areas. These problem areas must be identified and addressed prior to working on that area. Examples of some problem areas are recessed radiators, duct work in wall cavities, recessed bookshelves, stairways on exterior walls, loose or cracked plaster on walls, poor siding, pocket doors, chimneys, etc. Check wall areas for wall hangings that should be removed prior to working on walls. The process and the work that is to be performed should be

explained to the CUSTOMER. Any potential problems discovered should be discussed with a CUSTOMER before commencing work.

2. Inspect cavity or framing detail for wiring, piping or ductwork. Do not densepack ductwork or space containing unsealed ductwork, or isolate plumbing from house – provide a sealed barrier continuous to adjacent airtight cavities or building element. Provide wood or foam plugs in sheathing. Repair openings made in weather barrier, replace siding and refasten with matching or larger fasteners. Touch up nail holes with silicone based sealant.
3. Installation Procedures
   a. All wall insulation shall be installed through holes with minimum diameters of 2 1/8" or greater, i.e. large enough to accommodate a fill tube. Exception: wall cavities less than 12" in height.
   b. Use of a fill tube to ensure consistent insulation coverage and density is strongly encouraged. Usually one hole is required per cavity, located to allow the fill to reach both ends of the cavity, with additional holes required if there are obstructions in the wall cavity.
   c. Contractor shall only use equipment compatible with the insulation material used or an all fiber machine. Contractor shall follow the manufacturer's recommendations for air pressure and density to achieve dense pack standards. Most small airlock machines are suitable if designed and maintained to provide at least 80 inches of water column or 2.9 PSI static air pressure when operated at full air with the outlet blocked and no feed. Dense pack requires at least 3.5 pounds per cubic foot or higher with a cavity depth over 4".
   d. Keep a record of the number of bags used to insure the installed insulation conforms to the manufacturer's recommended coverage shown on the material label, 1 pound per square foot for 2x4 wall framing**.** Certificate of Insulation that lists the bag counts for each area that was insulated must be posted upon completion of work.
   e. Do not leave open holes in wall overnight. Any holes must be plugged before Contractor leaves work site. All drilled wood surfaces must be plugged with a wooden plug. Other drilled holes may be plugged with Styrofoam plugs.
4. Drill and Plug (D&P) Applications.
   a. Exterior drill and plug applications on painted surfaces must be completed in the following manner:
      i. After installation, a plug must be inserted so it is flush or slightly (1/16") recessed. At edge irregularities apply one or two coats of an exterior rated filler (Durham Rock Hard wood putty, DAP exterior vinyl spackling or equivalent.)
      ii. This procedure also applies to drill and plug applications on windowsills, frieze boards, and entrances. Note: drilling window sills creates a serious water intrusion risk if not made watertight and should not be performed where a pan flashing or sill wrap is in place. Do not drill sills on homes built since 1990. Foam or urethane sealant below the surface plug may reduce water entry but cannot return integrity of pan flashing.
   b. Exterior drill and plug applications on stained surfaces must be completed in the following manner:
      a. After installation, insert a plug so that is it flush with the existing siding. The plug should be installed by placing a block of wood over the plug and tapping it until the plug is flush with the siding.
   c. Interior drill and plug applications must be completed in the following manner:
      a. After installation, insert a plug so that it is (3/8") recessed. Apply 1-2 coats of setting joint compound, Durabond 90 or equal, patching material or a plaster

repair product filling just flush to the existing surface.

b. Some examples of this application would be exterior walls (not done from the outside), stairway walls, garage ceilings, and slopes.

Post-Installation Procedures

The Contractor shall review the entire job to ensure that all aspects of the job are completed. Before leaving the work site, the Contractor shall assure:

1. All the siding repaired and/or reinstalled
2. Shutters are reinstalled
3. The outside work area and yard are cleaned up to pre-existing conditions
4. The basement/house is cleaned of all debris
5. The client is satisfied with the quality of the work
6. The Program incentive application is complete with all documentation attached
7.

Weatherstripping

1. All weatherstripping will be permanently installed with fasteners (tacks, staples, brads, etc.) and will make positive contact between surfaces to prevent air leakage.
2. Window weatherstripping
    a. "Three-sided:" LOWER sash channels, & sill; or, if window has spring loaded channels: top, bottom and meeting rail.
    b. "Four-sided:" LOWER sash channels, meeting rail & sill
    c. "Seven-sided:" UPPER & LOWER sash channels, meeting rail, sill & head jamb
3. The weatherstripping will form an air tight seal when the window is closed and latched. A small bead of caulk will be applied as necessary to prevent air leakage behind the weatherstripping
4. The weatherstripping will not interfere with the smooth operation of the door or window.
5. Attic hatch or scuttle openings
    a. Weatherstripping will be permanently affixed to hatch or framing. Generally "Q-lon with carrier" or equivalent is preferred.
    b. A positive closing mechanism will be installed on the hatch if needed.
    c. Existing access to the attic will be maintained.
    d. In the case of drop down folding stairs, an air tight, insulated cap will be built over the opening.
    e. Kneewall access doors will be treated like attic hatch doors whenever possible.

Floor Insulation

1. Locate and note the pathways that plumbing, wiring, heat runs, air return runs and gas lines take through the enclosed floors. Also note any recessed light fixtures in these floors or in nearby floor areas which share the same joist cavities. Take steps to assure that the installation of insulation will not damage or in any way hinder the normal function of those services. In some cases, cavities or groups of cavities may have to be left uninsulated.
2. Insulation should be blown into enclosed floors to capacity.
3. When the drill and plug method is used on garage ceiling, the holes must be plugged and finished with a spackle type compound flush with the ceiling.
4. When the drill and plug method is used on exterior floor overhangs, the holes must be plugged and finished with an exterior wood filler flush with the exterior surface.

APPENDIX 16.5

DUCT SEALING AND DUCT INSULATION GUIDANCE

16.5.1 DUCTED AIR DISTRIBUTION

The forced-air system consists of an air handler (furnace, heat pump, air conditioner) with its heat exchanger along with attached ducts. The annual system efficiency of forced-air heating and air-conditioning systems depends on the following issues.

- Duct leakage
- System airflow
- Blower operation
- Balance between supply and return air
- Duct insulation levels
- System location

16.5.2 Duct Sealing Eligibility Sequence of Operations

The evaluation and improvement of ducts has a logical sequence of steps.

- **Determine whether more than 30% of the ducts are located outside of the conditioned space**
    - Only duct systems located more than 30% outside of conditioned space are eligible for duct sealing
    - To determine if a duct system is more than 30% outside of the conditioned space, the total length of the duct system and the length of the system in conditioned space should be measured with a tape. If the length of duct in conditioned space is less than half of the total length, the duct system is eligible for duct sealing

- **Evaluate the ducts visually for air leakage/condition and decide whether duct-sealing is needed.**
    - Only duct systems with an evaluated leakage category of “some observable leaks” or “significant leaks” are eligible for duct sealing. These terms are defined in Section 16.5.3.
    - Only duct work that has properly attached connections and whose air flow has not been compromised due to crushed ducts.

NOTE: If the duct system has ducts that are crushed or improperly attached/disconnected to the point that the Energy Specialist believes that the system cannot be adequately sealed without first fixing ductwork, then refer the

customer to a program approved list of HVAC contractors to evaluate the duct systems condition.

- **Determine if the system airflow meets program requirements for proper flow.**
    - *Only* systems with airflow CFM falling within program recommended airflow rates are eligible for duct sealing.
    - *Only* Duct systems with accessible filter slots or single return grilles will have its' airflow measured using the True Flow Plates
    - Duct airflow can be assessed using the **Temperature Rise** method provided that the system is **HEATING ONLY**. All systems with **COOLING** must have a TRUE-FLOW test in order to qualify to be duct sealed.
    - See section 16.5.4 for details on performing airflow measurements with True Flow Plates or the temperature rise method.

Additional duct systems that should not be evaluated for duct sealing opportunities are as follows:

- Duct board systems are not eligible for duct sealing under this program
- High velocity systems are not eligible for duct sealing under this program
- Systems insulated with radiant bubble wrap are not eligible for duct sealing under this program, unless the bubble wrap is deemed by the energy specialist to have an effective R-value of under R-3. In which case, the bubble wrap would be removed and the ducts would be insulated to R-8.
- Any repair work requiring the use of HVAC industry tools and materials other than a cable tie (Zip Tie) tensioner will be referred to program approved list of HVAC contractors

16.5.2.1 Determine the Distribution System Efficiency (DSE) by visually evaluating the three duct characteristics below. Use the Building Performance Institute's 'Distribution Efficiency Look-Up Table' and the results of the duct system evaluation below to lookup the DSE. Alternately, enter inputs required by the program-approved energy modeling software, then the software will evaluate the system's distribution system efficiency and energy savings from any duct weatherization.

1. Percentage of duct work located outside of the conditioned space
2. Duct leakage evaluation
3. Duct insulation evaluation

The DSE should be determined before duct sealing and insulation, and after duct sealing and insulation. The increase in DSE due to duct weatherization will be used to calculate the energy savings as outlined in the ENERGY SAVING CALCULATIONS section 16.5.5 below.

16.5.3 Evaluating Duct Air Leakage

Duct leakage is a major energy-waster in homes where the ducts are located outside the home's thermal boundary in a crawl space, attic, attached garage. When these intermediate zones remain outside the thermal boundary, duct sealing is usually cost-effective.

Ducts in unconditioned space with ***some observable leakage*** will be eligible for duct sealing.

- ***Some observable leakage****:* Joints are not sealed with an approved sealant and there are gaps at most of the seams. Duct insulation shows discoloration at most field joints.

NOTE: Duct leakage within the thermal boundary or in Semi Conditioned Spaces like basements will not qualify to be duct sealed.

16.5.4 Specifying Duct Sealing Hours.

Duct sealing man hours will be determined based on liner footage of existing ridged duct work and existing duct insulation.

- 4 Man Hrs. (un-insulated rigid ducts less than 200 liner feet.)
- 6 Man Hrs. (un-insulated rigid ducts greater than 200 liner feet.)
- 8 Man Hrs. (insulated rigid ducts less than 200 liner feet.)
- 12 Man Hrs. (insulated rigid ducts greater than 200 liner feet.)

16.5.5 Airflow Measurement Tests

In order to be eligible for duct sealing in the program, duct systems must meet the following airflow rates for the equipment they serve.

- For systems with cooling, **CFM per ton** must be at or **above 300**.
  NOTE: If initial airflow test results are within 10% of the program 300 cfm per ton requirement, they will be considered to have met the program guidelines.

- For fossil fuel/Electric Furnace only heating systems, the measured Heat Rise must be within manufacturer's recommended range. Program default maximum temperature rise 80 deg F. will be used when manufacture data is not available.

Duct System air handlers must meet program airflow requirement to be eligible for sealing. The two airflow tests described below are the only tests approved in the program at this time. Any new testing methods must meet program approval. Remember when properly testing system airflow that all zone, register and balancing dampers must be in their fully open position. All duct systems that have cooling will require a True flow test. If one cannot be done than duct sealing cannot take place.

NOTE: When completing Flow test on cooling equipment the thermostat should be set on

cooling mode for the most accurate air flow results. When outside temperatures are below 60 deg. F. cooling equipment should not be turned on, use fan only mode.

1. Duct systems with accessible filter slot at the air handler or accessible single return filter grille will use True Flow Plates to measure system airflow. Instructions for installing the True Flow Plates and correctly measuring system airflow can be found here: http://dev.energyconservatory.com/wp-content/uploads/2014/07/TrueFlow-Manual-DG700.pdf

   NOTE: When the model number for the cooling equipment cannot be obtained to determine the required system airflow eligibility, the following can be used as a default:

   - 400 cfm per 500 sq.ft. of conditioned cooling space

2. **Heating only systems** will use the Temperature Rise method to assess system airflow. This method is described here:

a. Drill a ¼ inch hole in a straight section of the **supply plenum** or trunk. Be sure the hole is around at least one duct bend. The temperature probe should not have direct "line of sight" with the heat exchanger.

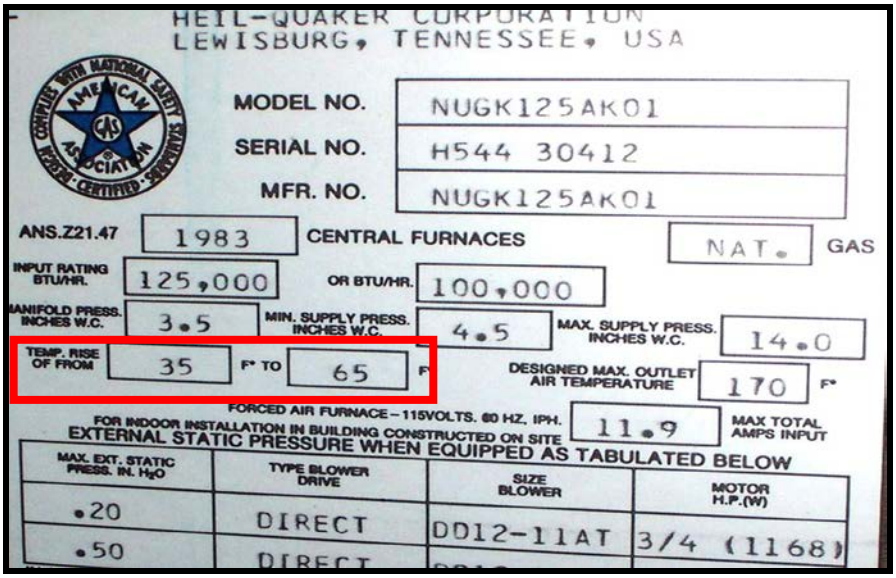
b. Drill a ¼ inch hole in a straight section of **return plenum** or trunk.

c. Insert a temperature probe into each drill hole in the Return and Supply. Be sure the probe extends into the middle of the duct and not along the sides.

d. Turn the system on and allow it to run for 10 minutes or until the supply and return side temperatures stabilize.

e. Read and record the supply and return side temperatures. Subtract the return side temperature from the supply side temperature. This is the systems' temperature heat rise.

f. Compare the measured heat rise from steps a-e to the manufacturer's acceptable heat rise range for the system data plate (red box).



g. If the measured heat rise falls within the manufacturer's projected range the airflow is acceptable and the system can be sealed.

Example: A 60, 000 btu/HR. output furnace has a supply side temperature of 120 degrees and the return side of 70 degrees. The difference between the two measurements is 50 degrees. The acceptable temperature rise as read from the data plate is 35-65 degrees. 50 degrees falls between 30-60 degrees and passes the heat rise test and so the system can be sealed. Systems that fail the test with a heat rise higher than manufacturer's projections have low air flow and should not be sealed.

16.5.6 Evaluating Existing Duct Insulation

Duct systems with an **effective** R-value of 3 or greater are not eligible to be insulated. When determining the effective R-value of existing duct insulation to be upgraded to R-8 take the following into consideration.

- Effective R-value of 2 or less regardless of install quality is eligible.
- Duct insulation with compression of insulation to less than 1 inch is eligible
- Ducts that have poorly installed insulation that is falling off or not properly fastened with multiple exposed ducts.
- Existing Duct insulation that will be compromised during duct sealing to the point that it will not be able to be re-installed due to its poor deteriorated condition.

NOTE: Duct insulation can only be recommended when Duct Sealing will be part of the work scope.

16.5.7 ENERGY SAVING CALCULATIONS

16.5.7.1 Evaluation of Distribution Efficiency – this methodology requires the evaluation of three duct characteristics below:

1. Percentage of duct work found within the conditioned space
2. Duct leakage evaluation
3. Duct insulation evaluation

These three characteristics which should have been determined using the guidance from Section 16.5.1-16.5.4 will be used to determine the distribution efficiency by using the Building Performance Institutes 'Distribution Efficiency Look-Up Table' located below Section 16.5.5.2, or calculated using program approved energy modeling software. Distribution system efficiency will be evaluated in the following two conditions:

Definition of Baseline Condition
The existing baseline condition is leaky duct work within the unconditioned space in the home.

Definition of Efficient Condition
The efficient condition is sealed duct work throughout the unconditioned space in the home.

16.5.7.2 Evaluation of Appliance Efficiency: Determining appliance efficiency for use in the Energy Savings Calculations will be accomplished using the following methods:

1. Fossil Fuel Appliances:
If the yellow Energy Guide efficiency sticker is still attached, use that value.
If the yellow Energy Guide sticker is no longer attached to the appliance, use program default.

Efficiency Ratings

Default Oil Furnace Efficiencies	AFUE
Condensing unit Direct Vent	0.90
Induce Draft	0.80
Natural Draft	0.72

Default Gas/ Propane furnace Efficiencies	AFUE
Condensing unit Direct Vent	0.90
Induce Draft	0.82
Natural Draft	0.78

2. Air Source Heat Pump
If the yellow Energy Guide efficiency sticker is still attached, use that value.
If the yellow Energy Guide sticker is not available use the following tables to estimate appliance efficiency.

Heat Pump (Air Source-heating) Efficiencies	HSPF
Energy Star Sept 2015 to present	8.5
Energy Star Sept 2006 - Aug 2015	8.2
2015 or newer	8
2006 to 2014	7.7
1992 to 2005	7.1
Before 1992	6.6

3. Cooling Appliances:

If the yellow Energy Guide efficiency sticker is still attached, use that value.
If the yellow Energy Guide sticker is not available use the following tables to estimate appliance efficiency.

Default Air Conditioning/Heat Pump Efficiencies	**SEER**
2015 and newer Energy Star	15
2006 - 2014 Energy Star	14.5
2015 and newer **NOT** Energy Star	14
2006 - 2014 **NOT** Energy Star	13
1992 - 2005	10
Before 1992	9

This table is also located at: http://www.bpi.org/files/pdf/DistributionEfficiencyTable-BlueSheet.pdf

DISTRIBUTION EFFICIENCY LOOK-UP TABLE

Distribution Efficiency Table

System Charateristics (there are 3 questions you need to answer about the distribution system)

1 What percentage of the ducts are located within the conditioned space
2 How well are the connections on the duct system sealed
3 What is the insulation value on the ducts for the portion outside the conditioned space

	1. % within conditioned space			2. Duct leakage Charateristics					3. Duct insulation value		
Distribution Efficiency	90% or more inside envelope	50% or more inside envelope	less than 50% inside envelope	Connections sealed w/mastic	No observable leaks	Some observable leaks	Significant leaks	Catastrophic leaks	Ducts outside envelope R-8 or greater	Ducts outside envelope R-4 - R-7	Ducts outside envelope < R-4
95%	XXX			XXX					XXX		
94%	XXX			XXX						XXX	
93%	XXX			XXX							XXX
94%	XXX				XXX				XXX		
93%	XXX				XXX					XXX	
92%	XXX				XXX						XXX
90%	XXX					XXX			XXX		
89%	XXX					XXX				XXX	
88%	XXX					XXX					XXX
85%	XXX						XXX		XXX		
84%	XXX						XXX			XXX	
83%	XXX						XXX				XXX
80%	XXX							XXX	XXX		
79%	XXX							XXX		XXX	
78%	XXX							XXX			XXX
90%		XXX		XXX					XXX		
89%		XXX		XXX						XXX	
88%		XXX		XXX							XXX
84%		XXX			XXX				XXX		
83%		XXX			XXX					XXX	
82%		XXX			XXX						XXX
80%		XXX				XXX			XXX		
79%		XXX				XXX				XXX	
78%		XXX				XXX					XXX
75%		XXX					XXX		XXX		
74%		XXX					XXX			XXX	
73%		XXX					XXX				XXX
70%		XXX						XXX	XXX		
69%		XXX						XXX		XXX	
68%		XXX						XXX			XXX
80%			XXX	XXX					XXX		
79%			XXX	XXX						XXX	
78%			XXX	XXX							XXX
74%			XXX		XXX				XXX		
73%			XXX		XXX					XXX	
72%			XXX		XXX						XXX
70%			XXX			XXX			XXX		
69%			XXX			XXX				XXX	
68%			XXX			XXX					XXX
65%			XXX				XXX		XXX		
64%			XXX				XXX			XXX	
63%			XXX				XXX				XXX
60%			XXX					XXX	XXX		
59%			XXX					XXX		XXX	
58%			XXX					XXX			XXX

Example: If you have a system with more than 90% inside the conditioned space (i.e. in a heated basement) and the system is sealed with mastic and the portion of the duct system that is not in the heated space has an R-value of R-4, the distribution efficiency of the system is 94%.

The annual energy savings from duct weatherization will be determined using one of the following methods:

1. Using approved energy modeling software to determine modeled energy savings. This method will use complex algorithms to consider how duct weatherization will interact with other energy efficiency measures installed in the home, and how that will affect energy savings.
2. Use the formulas below to calculate energy savings from duct weatherization.

ANNUAL ENERGY SAVING ALGORITHMS:
Determine Distribution Efficiency by evaluating duct system before and after duct sealing using Building Performance Institute "Distribution Efficiency Look-Up Table"

Cooling savings from reduction in Air Conditioning Load:
ΔkWh cooling = ((((DEafter – DEbefore)/ DEafter)) * FLHcool * BtuH) / 1,000 / ηCool

Where:
DEafter = Distribution Efficiency after duct sealing
DEbefore = Distribution Efficiency before duct sealing
*FLHcool = Full Load Cooling Hours**
BtuH = Size of equipment in Btuh (note 1 ton = 12,000Btuh)
ηCool = Efficiency in SEER of Air Conditioning equipment= actual. If not available use:

Heating savings for homes with electric heat (Heat Pump of resistance):
kWh = (((((DEafter – DEbefore)/ DEafter)) * FLHheat * BtuH) / 1,000,000 / ηHeat) * 293.1

Where:
*FLHheat = Full Load Heating Hours***
BtuH = *Size of equipment in Btuh (note 1 ton = 12,000Btuh)*
ηHeat = Efficiency in COP of Heating equipment (HSPF)

For homes with Fossil Fuel Heating:
ΔMMBTUfossil fuel = ((((DEafter – DEbefore)/ DEafter)) * FLHheat * BtuH) / 1,000,000 / ηHeat

Where:
DEafter = Distribution Efficiency after duct sealing
DEbefore = Distribution Efficiency before duct sealing
*FLHheat = Full Load Heating Hours***
BtuH = Capacity of Heating System
ηHeat = Efficiency of Heating equipment

The MA TRM sets 360 hours as the full load cooling hours for MA and 1200 heating hours as the full load heating hours for MA.

Berkshire Gas 2020 Pricing

Measure Pricing	
Air Sealing	
Perform Air Sealing at Estimated 62.5 CFM50 Per Hour	$ 102.50
Perform Air Sealing at Estimated 62.5 CFM50 Per Hour	$ 102.50
Additional Air Sealing hours (hours over initial 8)	$ 102.50
Transition Air Sealing per Linear Foot	$ 6.85
Door Sweep	$ 29.25
Exterior Door Weatherstripping	$ 34.50
Permit Fee	$ 75.00
Attic Insulation Measures	
Attic Floor	
Attic Floor Open Blow Cellulose 3"	$ 1.46
Attic Floor Open Blow Cellulose 4"	$ 1.55
Attic Floor Open Blow Cellulose 5"	$ 1.64
Attic Floor Open Blow Cellulose 6"	$ 1.72
Attic Floor Open Blow Cellulose 7"	$ 1.77
Attic Floor Open Blow Cellulose 8"	$ 1.82
Attic Floor Open Blow Cellulose 9"	$ 1.88
Attic Floor Open Blow Cellulose 10"	$ 1.94
Attic Floor Open Blow Cellulose 11"	$ 1.99
Attic Floor Open Blow Cellulose 12"	$ 2.06
Attic Floor Open Blow Cellulose 13"	$ 2.12
Attic Floor Open Blow Cellulose 14"	$ 2.18
Attic Floor Open Blow Cellulose 15"	$ 2.26
Attic Floor Enclosed Cellulose Dense Pack 4"	$ 2.28
Attic Floor Enclosed Cellulose Dense Pack 5"	$ 2.34
Attic Floor Enclosed Cellulose Dense Pack 6"	$ 2.39
Attic Floor Enclosed Cellulose Dense Pack 7"	$ 2.45
Attic Floor Enclosed Cellulose Dense Pack 8"	$ 2.51
Attic Floor Enclosed Cellulose Dense Pack 9"	$ 2.56
Attic Floor Enclosed Cellulose Dense Pack 10"	$ 2.67
Attic Floor Enclosed Cellulose Dense Pack 11"	$ 2.78
Attic Floor Enclosed Cellulose Dense Pack 12"	$ 2.84
Install 4" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.63
Install 5" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.69
Install 6" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.75
Install 7" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.81
Install 8" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.85
Install 9" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.92
Install 10" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$ 1.97

Install 11" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$	2.02
Install 12" Cellulose in Enclosed Attic Floor (NON DENSEPACK)	$	2.08
Attic Slope		
Install 3" Fiberglass Batting In Open Attic Floor	$	1.83
Install 6" Fiberglass Batting In Open Attic Floor	$	2.05
Install 9" Fiberglass Batting In Open Attic Floor	$	2.28
Install 3" Fiberglass Batting In Open Attic Slope	$	1.85
Install 6" Fiberglass Batting In Open Attic Slope	$	2.06
Install 9" Fiberglass Batting In Open Attic Slope	$	2.30
Attic Slope Enclosed Cellulose Dense Pack 4"	$	2.84
Attic Slope Enclosed Cellulose Dense Pack 5"	$	2.82
Attic Slope Enclosed Cellulose Dense Pack 6"	$	2.91
Attic Slope Enclosed Cellulose Dense Pack 7"	$	3.01
Attic Slope Enclosed Cellulose Dense Pack 8"	$	3.12
Attic Slope Enclosed Cellulose Dense Pack 9"	$	3.23
Attic Slope Enclosed Cellulose Dense Pack 10"	$	3.35
Insulate Vaulted Roof From Interior With 4" Dense Pack Cellulose	$	3.88
Insulate Vaulted Roof From Interior With 5" Dense Pack Cellulose	$	3.99
Insulate Vaulted Roof From Interior With 6" Dense Pack Cellulose	$	4.09
Insulate Vaulted Roof From Interior With 7" Dense Pack Cellulose	$	4.21
Insulate Vaulted Roof From Interior With 8" Dense Pack Cellulose	$	4.31
Insulate Vaulted Roof From Interior With 9" Dense Pack Cellulose	$	4.44
Insulate Vaulted Roof From Interior With 10" Dense Pack Cellulose	$	4.56
Kneewall Floor		
Kneewall Floor Open Blow Cellulose 3"	$	1.46
Kneewall Floor Open Blow Cellulose 4"	$	1.60
Kneewall Floor Open Blow Cellulose 5"	$	1.68
Kneewall Floor Open Blow Cellulose 6"	$	1.75
Kneewall Floor Open Blow Cellulose 7"	$	1.81
Kneewall Floor Open Blow Cellulose 8"	$	1.86
Kneewall Floor Open Blow Cellulose 9"	$	1.93
Kneewall Floor Open Blow Cellulose 10"	$	1.98
Kneewall Floor Open Blow Cellulose 11"	$	2.06
Kneewall Floor Open Blow Cellulose 12"	$	2.10
Kneewall Floor Open Blow Cellulose 13"	$	2.12
Kneewall Floor Open Blow Cellulose 14"	$	2.18
Kneewall Floor Open Blow Cellulose 15"	$	2.26
Kneewall Floor Enclosed Cellulose Dense Pack 4"	$	2.24
Kneewall Floor Enclosed Cellulose Dense Pack 5"	$	2.33
Kneewall Floor Enclosed Cellulose Dense Pack 6"	$	2.40

Kneewall Floor Enclosed Cellulose Dense Pack 7"	$	2.45
Kneewall Floor Enclosed Cellulose Dense Pack 8"	$	2.53
Kneewall Floor Enclosed Cellulose Dense Pack 9"	$	2.61
Kneewall Floor Enclosed Cellulose Dense Pack 10"	$	2.68
Kneewall Floor Enclosed Cellulose Dense Pack 11"	$	2.76
Kneewall Floor Enclosed Cellulose Dense Pack 12"	$	2.82
Enclosed Kneewall Floor Cellulose 4" (NON DENSEPACK)	$	1.63
Enclosed Kneewall Floor Cellulose 5" (NON DENSEPACK)	$	1.69
Enclosed Kneewall Floor Cellulose 6" (NON DENSEPACK)	$	1.75
Enclosed Kneewall Floor Cellulose 7" (NON DENSEPACK)	$	1.81
Enclosed Kneewall Floor Cellulose 8" (NON DENSEPACK)	$	1.85
Enclosed Kneewall Floor Cellulose 9" (NON DENSEPACK)	$	1.93
Enclosed Kneewall Floor Cellulose 10" (NON DENSEPACK)	$	1.97
Enclosed Kneewall Floor Cellulose 11" (NON DENSEPACK)	$	2.06
Enclosed Kneewall Floor Cellulose 12" (NON DENSEPACK)	$	2.16
Install 3" Fiberglass Batting In Open Kneewall Floor	$	1.83
Install 6" Fiberglass Batting In Open Kneewall Floor	$	2.05
Install 9" Fiberglass Batting In Open Kneewall Floor	$	2.28
Kneewall Wall		
Enclosed Kneewall Cellulose Dense Pack 3"	$	2.51
Enclosed Kneewall Cellulose Dense Pack 4"	$	2.61
Enclosed Kneewall Cellulose Dense Pack 5"	$	2.77
Enclosed Kneewall Cellulose Dense Pack 6"	$	2.91
Install 2” Thermal Barrier Polyiso on Kneewall	$	5.09
Install 3" Fiberglass Batting In Open Kneewall	$	1.84
Install 6" Fiberglass Batting In Open Kneewall	$	2.06
Install 9" Fiberglass Batting In Open Kneewall	$	2.29
Kneewall Slope		
Kneewall Slope Cellulose Dense Pack 4"	$	2.77
Kneewall Slope Cellulose Dense Pack 5"	$	2.88
Kneewall Slope Cellulose Dense Pack 6"	$	2.97
Kneewall Slope Cellulose Dense Pack 7"	$	3.09
Kneewall Slope Cellulose Dense Pack 8"	$	3.18
Kneewall Slope Cellulose Dense Pack 9"	$	3.30
Kneewall Slope Cellulose Dense Pack 10"	$	3.39
Install 2” Thermal Barrier Polyiso on Kneewall Slope	$	5.44
Install 3" Fiberglass Batting In Open Kneewall Slope	$	1.85
Install 6" Fiberglass Batting In Open Kneewall Slope	$	2.07
Install 9" Fiberglass Batting In Open Kneewall Slope	$	2.30
Gable End Wall		

Insulate Gable Wall With 3" Dense Pack Cellulose	$ 2.51
Insulate Gable Wall With 4" Dense Pack Cellulose	$ 2.63
Install 2" Thermal Barrier Polyiso On Open Gable Wall	$ 5.28
Install 3" Fiberglass Batts in Open Gable Wall	$ 1.84
Install 6" Fiberglass Batts in Open Gable Wall	$ 2.06
Attic Access and Venting	
Sheathing Access	$ 37.90
Temporary Access	$ 102.50
Cut and Finish Access	$ 152.40
Hatch: Thermal Barrier Polyiso 2" (Attic)	$ 51.75
Door: Thermal Barrier Polyiso 2" (Attic)	$ 101.15
Attic Stair Cover Thermal Barrier	$ 262.80
Attic Stair Cover Thermal Barrier with carpentry	$ 302.45
Attic Stair Tent Cover	$ 235.15
Whole House Fan Box: Thermal Barrier Polyiso 2" (Attic)	$ 208.45
Damming	$ 2.40
Vent bath fan to soffit exhaust	$ 127.00
Vent bath fan to roof flapper	$ 152.15
Vent bath fan to gable end	$ 121.50
Install Aluminum Gable Vent (12"x12")	$ 128.75
Install Aluminum Gable Vent (12"x18")	$ 130.00
Install Aluminum Gable Vent (12"x24")	$ 136.40
Install Aluminum Gable Vent (18"x24")	$ 139.35
Install 8" Roof Vent	$ 129.75
Install Aluminum Soffit Vent (4x16')	$ 43.30
Install Aluminum Soffit Vent (6x16')	$ 43.30
Install Aluminum Soffit Vent (8x16')	$ 43.30
12" Mushroom Vent	$ 166.00
Install Turbine Vent	$ 166.00
Propavent 2' or 4'	$ 4.55
Propavent Half	$ 1.00
Install Ridge Vent Shingle Over (lnft)	$ 32.75
Basement, Crawlspace, Garage Insulation Measures	
Basement	
Install 2" Thermal Barrier Polyiso On Open Basement Ceiling	$ 5.31
Install 3" Fiberglass Batting In Open Basement Ceiling	$ 2.31
Install 6" Fiberglass Batting In Open Basement Ceiling	$ 2.56
Install 9" Fiberglass Batting In Open Basement Ceiling	$ 2.83
Install 2" Thermal Barrier Polyiso On Open Basement Wall	$ 5.31
Install 3.5" Fiberglass Batting on Open Basement Wall	$ 2.05

Basement Ceiling 4" Dense Pack	n/a
Basement Ceiling 5" Dense Pack	n/a
Basement Ceiling 6" Dense Pack	n/a
Basement Ceiling 7" Dense Pack	n/a
Basement Ceiling 8" Dense Pack	n/a
Crawlspace	
Crawlspace Ceiling Enclosed Cellulose 4"	$ 1.95
Crawlspace Ceiling Enclosed Cellulose 5"	$ 2.03
Crawlspace Ceiling Enclosed Cellulose 6"	$ 2.11
Crawlspace Ceiling Enclosed Cellulose 7"	$ 2.19
Crawlspace Ceiling Enclosed Cellulose 8"	$ 2.27
Crawlspace Ceiling Enclosed Cellulose 9"	$ 2.34
Crawlspace Ceiling Enclosed Cellulose 10"	$ 2.42
Crawlspace Ceiling Enclosed Cellulose 11"	$ 2.50
Crawlspace Ceiling Enclosed Cellulose 12"	$ 2.57
Crawlspace Ceiling Enclosed Cellulose Dense Pack 4"	$ 2.19
Crawlspace Ceiling Enclosed Cellulose Dense Pack 5"	$ 2.29
Crawlspace Ceiling Enclosed Cellulose Dense Pack 6"	$ 2.42
Crawlspace Ceiling Enclosed Cellulose Dense Pack 7"	$ 2.56
Crawlspace Ceiling Enclosed Cellulose Dense Pack 8"	$ 2.67
Crawlspace Ceiling Enclosed Cellulose Dense Pack 9"	$ 2.76
Crawlspace Ceiling Enclosed Cellulose Dense Pack 10"	$ 2.87
Crawlspace Ceiling Enclosed Cellulose Dense Pack 11"	$ 3.36
Crawlspace Ceiling Enclosed Cellulose Dense Pack 12"	$ 3.49
Install 2”Thermal Barrier Polyiso On Open Crawlspace Ceiling	$ 5.34
Install 3" Fiberglass Batting In Open Crawlspace Ceiling	$ 2.36
Install 6" Fiberglass Batting In Open Crawlspace Ceiling	$ 2.58
Install 9" Fiberglass Batting In Open Crawlspace Ceiling	$ 2.82
Install 2" Thermal Barrier Polyiso On Open Crawlspace Wall	$ 5.29
Install 3.5” Fiberglass Batting on Open Crawlspace Wall	$ 2.04
Garage	
Dense Pack 4" Cellulose In Garage Ceiling	$ 2.19
Dense Pack 5" Cellulose In Garage Ceiling	$ 2.28
Dense Pack 6" Cellulose In Garage Ceiling	$ 2.40
Dense Pack 7" Cellulose In Garage Ceiling	$ 2.54
Dense Pack 8" Cellulose In Garage Ceiling	$ 2.65
Dense Pack 9" Cellulose In Garage Ceiling	$ 2.75
Dense Pack 10" Cellulose In Garage Ceiling	$ 2.90
Dense Pack 11" Cellulose In Garage Ceiling	$ 3.36
Dense Pack 12" Cellulose In Garage Ceiling	$ 3.47

Overhang	
Insulate Overhang With 2” Thermal Barrier Polyiso	$ 5.31
Dense Pack 4" Cellulose In Overhang	$ 2.75
Dense Pack 5" Cellulose In Overhang	$ 2.89
Dense Pack 6" Cellulose In Overhang	$ 3.03
Dense Pack 7" Cellulose In Overhang	$ 3.17
Dense Pack 8" Cellulose In Overhang	$ 3.30
Dense Pack 9" Cellulose In Overhang	$ 3.43
Dense Pack 10" Cellulose In Overhang	$ 3.54
Dense Pack 11" Cellulose In Overhang	$ 3.67
Dense Pack 12" Cellulose In Overhang	$ 3.83
Insulate Open Overhang With 3" Fiberglass Batting	$ 2.35
Insulate Open Overhang With 6" Fiberglass Batting	$ 2.57
Insulate Open Overhang With 9" Fiberglass Batting	$ 2.79
Rim Joist	
Insulate Rim Joist With 2” Thermal Barrier Polyiso	$ 5.12
Insulate Rim Joist with 6.25" Fiberglass Batting	$ 2.42
Wall Insulation Measures	
Insulate Aluminum Sided Wall With 3" Dense Pack Cellulose	$ 2.91
Insulate Aluminum Sided Wall With 4" Dense Pack Cellulose	$ 3.01
Insulate Aluminum Sided Wall With 5" Dense Pack Cellulose	$ 3.17
Insulate Aluminum Sided Wall With 6" Dense Pack Cellulose	$ 3.27
Insulate Aluminum Sided Wall With 7" Dense Pack Cellulose	$ 3.37
Insulate Aluminum Sided Wall With 8" Dense Pack Cellulose	$ 3.47
Insulate 3rd FL Aluminum Sided Wall With 3" Dense Pack Cellulose	$ 3.45
Insulate 3rd FL Aluminum Sided Wall With 4" Dense Pack Cellulose	$ 3.56
Insulate 3rd FL Aluminum Sided Wall With 5" Dense Pack Cellulose	$ 3.71
Insulate 3rd FL Aluminum Sided Wall With 6" Dense Pack Cellulose	$ 3.88
Insulate 3rd FL Aluminum Sided Wall With 7" Dense Pack Cellulose	$ 4.01
Insulate 3rd FL Aluminum Sided Wall With 8" Dense Pack Cellulose	$ 4.13
Insulate Asbestos Sided Wall With 3" Dense Pack Cellulose	$ 3.21
Insulate Asbestos Sided Wall With 4" Dense Pack Cellulose	$ 3.31
Insulate Asbestos Sided Wall With 5" Dense Pack Cellulose	$ 3.40
Insulate Asbestos Sided Wall With 6" Dense Pack Cellulose	$ 3.53
Insulate Asbestos Sided Wall With 7" Dense Pack Cellulose	$ 3.65
Insulate Asbestos Sided Wall With 8" Dense Pack Cellulose	$ 3.73
Insulate 3rd FL Asbestos Sided Wall With 3" Dense Pack Cellulose	$ 3.64
Insulate 3rd FL Asbestos Sided Wall With 4" Dense Pack Cellulose	$ 3.79
Insulate 3rd FL Asbestos Sided Wall With 5" Dense Pack Cellulose	$ 3.93
Insulate 3rd FL Asbestos Sided Wall With 6" Dense Pack Cellulose	$ 4.05

Insulate 3rd FL Asbestos Sided Wall With 7" Dense Pack Cellulose	$	4.19
Insulate 3rd FL Asbestos Sided Wall With 8" Dense Pack Cellulose	$	4.34
Insulate Asphalt Sided Wall With 3" Dense Pack Cellulose	$	2.67
Insulate Asphalt Sided Wall With 4" Dense Pack Cellulose	$	2.76
Insulate Asphalt Sided Wall With 5" Dense Pack Cellulose	$	2.87
Insulate Asphalt Sided Wall With 6" Dense Pack Cellulose	$	2.94
Insulate Asphalt Sided Wall With 7" Dense Pack Cellulose	$	3.04
Insulate Asphalt Sided Wall With 8" Dense Pack Cellulose	$	3.14
Insulate 3rd FL Asphalt Sided Wall With 3" Dense Pack Cellulose	$	2.93
Insulate 3rd FL Asphalt Sided Wall With 4" Dense Pack Cellulose	$	3.04
Insulate 3rd FL Asphalt Sided Wall With 5" Dense Pack Cellulose	$	3.16
Insulate 3rd FL Asphalt Sided Wall With 6" Dense Pack Cellulose	$	3.33
Insulate 3rd FL Asphalt Sided Wall With 7" Dense Pack Cellulose	$	3.45
Insulate 3rd FL Asphalt Sided Wall With 8" Dense Pack Cellulose	$	3.59
Insulate Clapboard Sided Wall With 3" Dense Pack Cellulose	$	2.51
Insulate Clapboard Sided Wall With 4" Dense Pack Cellulose	$	2.55
Insulate Clapboard Sided Wall With 5" Dense Pack Cellulose	$	2.63
Insulate Clapboard Sided Wall With 6" Dense Pack Cellulose	$	2.71
Insulate Clapboard Sided Wall With 7" Dense Pack Cellulose	$	2.78
Insulate Clapboard Sided Wall With 8" Dense Pack Cellulose	$	2.85
Insulate 3rd FL Clapboard Sided Wall With 3" Dense Pack Cellulose	$	2.73
Insulate 3rd FL Clapboard Sided Wall With 4" Dense Pack Cellulose	$	2.82
Insulate 3rd FL Clapboard Sided Wall With 5" Dense Pack Cellulose	$	3.01
Insulate 3rd FL Clapboard Sided Wall With 6" Dense Pack Cellulose	$	3.14
Insulate 3rd FL Clapboard Sided Wall With 7" Dense Pack Cellulose	$	3.27
Insulate 3rd FL Clapboard Sided Wall With 8" Dense Pack Cellulose	$	3.40
Insulate Buffered Wall From Interior With 3" Dense Pack Cellulose	$	2.71
Insulate Buffered Wall From Interior With 4" Dense Pack Cellulose	$	2.83
Insulate Buffered Wall From Interior With 5" Dense Pack Cellulose	$	2.99
Insulate Buffered Wall From Interior With 6" Dense Pack Cellulose	$	3.14
Insulate Wall From Interior With 3" Dense Pack Cellulose	$	2.47
Insulate Wall From Interior With 4" Dense Pack Cellulose	$	2.53
Insulate Wall From Interior With 5" Dense Pack Cellulose	$	2.65
Insulate Wall From Interior With 6" Dense Pack Cellulose	$	2.68
Insulate Multi-Layer Siding Wall With 3" Dense Pack Cellulose	$	3.32
Insulate Multi-Layer Siding Wall With 4" Dense Pack Cellulose	$	3.46
Insulate Multi-Layer Siding Wall With 5" Dense Pack Cellulose	$	3.61
Insulate Multi-Layer Siding Wall With 6" Dense Pack Cellulose	$	3.81
Insulate Multi-Layer Siding Wall With 7" Dense Pack Cellulose	$	4.00
Insulate Multi-Layer Siding Wall With 8" Dense Pack Cellulose	$	4.15

Insulate 3rd FL Multi-Layer Siding Wall With 3" Dense Pack Cellulose	$	3.90
Insulate 3rd FL Multi-Layer Siding Wall With 4" Dense Pack Cellulose	$	4.12
Insulate 3rd FL Multi-Layer Siding Wall With 5" Dense Pack Cellulose	$	4.34
Insulate 3rd FL Multi-Layer Siding Wall With 6" Dense Pack Cellulose	$	4.51
Insulate 3rd FL Multi-Layer Siding Wall With 7" Dense Pack Cellulose	$	4.69
Insulate 3rd FL Multi-Layer Siding Wall With 8" Dense Pack Cellulose	$	4.91
Install 2" Thermal Barrier Polyiso on Open Wall	$	5.31
Install 3.5" Fiberglass Batting In Open Wall	$	1.89
Install 6" Fiberglass Batting In Open Wall	$	2.13
Install 9" Fiberglass Batting In Open Wall	$	2.37
Insulate Vinyl Sided Wall With 3" Dense Pack Cellulose	$	2.46
Insulate Vinyl Sided Wall With 4" Dense Pack Cellulose	$	2.52
Insulate Vinyl Sided Wall With 5" Dense Pack Cellulose	$	2.71
Insulate Vinyl Sided Wall With 6" Dense Pack Cellulose	$	2.79
Insulate Vinyl Sided Wall With 7" Dense Pack Cellulose	$	2.88
Insulate Vinyl Sided Wall With 8" Dense Pack Cellulose	$	2.97
Insulate 3rd FL Vinyl Sided Wall With 3" Dense Pack Cellulose	$	2.79
Insulate 3rd FL Vinyl Sided Wall With 4" Dense Pack Cellulose	$	2.86
Insulate 3rd FL Vinyl Sided Wall With 5" Dense Pack Cellulose	$	3.10
Insulate 3rd FL Vinyl Sided Wall With 6" Dense Pack Cellulose	$	3.23
Insulate 3rd FL Vinyl Sided Wall With 7" Dense Pack Cellulose	$	3.38
Insulate 3rd FL Vinyl Sided Wall With 8" Dense Pack Cellulose	$	3.50
Insulate Wood Sided Wall With 3" Dense Pack Cellulose	$	2.55
Insulate Wood Sided Wall With 4" Dense Pack Cellulose	$	2.66
Insulate Wood Sided Wall With 5" Dense Pack Cellulose	$	2.79
Insulate Wood Sided Wall With 6" Dense Pack Cellulose	$	2.90
Insulate Wood Sided Wall With 7" Dense Pack Cellulose	$	3.00
Insulate Wood Sided Wall With 8" Dense Pack Cellulose	$	3.07
Insulate 3rd FL Wood Sided Wall With 3" Dense Pack Cellulose	$	2.76
Insulate 3rd FL Wood Sided Wall With 4" Dense Pack Cellulose	$	2.91
Insulate 3rd FL Wood Sided Wall With 5" Dense Pack Cellulose	$	3.05
Insulate 3rd FL Wood Sided Wall With 6" Dense Pack Cellulose	$	3.20
Insulate 3rd FL Wood Sided Wall With 7" Dense Pack Cellulose	$	3.37
Insulate 3rd FL Wood Sided Wall With 8" Dense Pack Cellulose	$	3.49
Insulate Wood Shingle Sided Wall With 3" Dense Pack Cellulose	$	2.46
Insulate Wood Shingle Sided Wall With 4" Dense Pack Cellulose	$	2.63
Insulate Wood Shingle Sided Wall With 5" Dense Pack Cellulose	$	2.79
Insulate Wood Shingle Sided Wall With 6" Dense Pack Cellulose	$	2.94
Insulate Wood Shingle Sided Wall With 7" Dense Pack Cellulose	$	3.09
Insulate Wood Shingle Sided Wall With 8" Dense Pack Cellulose	$	3.25

Insulate 3rd FL Wood Shingle Sided Wall With 3" Dense Pack Cellulose	$ 2.72
Insulate 3rd FL Wood Shingle Sided Wall With 4" Dense Pack Cellulose	$ 2.87
Insulate 3rd FL Wood Shingle Sided Wall With 5" Dense Pack Cellulose	$ 3.01
Insulate 3rd FL Wood Shingle Sided Wall With 6" Dense Pack Cellulose	$ 3.16
Insulate 3rd FL Wood Shingle Sided Wall With 7" Dense Pack Cellulose	$ 3.34
Insulate 3rd FL Wood Shingle Sided Wall With 8" Dense Pack Cellulose	$ 3.45
Duct Sealing and Heating System Pipe Insulation	
Duct Sealing (hour)	$ 98.00
Duct Insulation 2" (sqft)	$ 4.05
Insulate (1.0" steam pipes)	$ 8.35
Insulate (1.25" steam pipes)	$ 8.35
Insulate (1.5" steam pipes)	$ 9.63
Insulate (1.75" steam pipes)	$ 9.63
Insulate (2.0" steam pipes)	$ 9.63
Insulate (2.25" steam pipes)	$ 10.19
Insulate (2.5" steam pipes)	$ 10.19
Insulate (2.75" steam pipes)	$ 10.19
Insulate (3.0" steam pipes)	$ 10.19
Insulate (0.5" hydronic pipes)	$ 5.17
Insulate (0.75" hydronic pipes)	$ 5.17
Insulate (0.875" hydronic pipes)	$ 5.64
Insulate (1" hydronic pipes)	$ 5.64
Insulate (1.25" hydronic pipes)	$ 5.96
Insulate (1.5" hydronic pipes)	$ 6.34
Insulate (1.75+" hydronic pipes)	$ 6.34
Insulate (2.0+" hydronic pipes)	$ 6.34
Other Miscellaneous Measures	
6mm Poly Vapor Barrier	$ 0.98
Balloon Framing Blocking	$ 1.44
Insulation Removal **(not an incentive eligible measure)**	$ 1.50
Reinforced Strap (Used for enclosing framing to densepack)	$ 0.52
Pipe Tenting	$ 2.52
Blower Door Test Only	$ 79.86
Replace Bath Fan Hose	$ 43.07
Gable Vent Installed in a Window	$ 116.23
Fsk - Ignition Barrier - sq ft	$ 1.49

Attachment 6
Customer Referral Process

Participating Contractor Referral Process Steps:

1. A participating Independent Installation Contractor (IIC) identifies a client via independent marketing, visits the proposed work site and creates a scope of work that is consistent with the Mass Save ***Materials Installation Standards***.

2. The IIC then completes a Participating Contractor Referral (PCR) form on which it has obtained the customer's signature, and leaves a copy of the form with the customer.

3. After completing the site visit, the IIC must scan and email the signed "Contractor" copy of the form to contractorinbox@cetonline.org.

4. Once the completed PCR form is received, a representative from the Mass Save program will call the customer to confirm the IIC choice, schedule a Home Energy Assessment with the customer, and tag the resulting Site ID as referred by that IIC. This will eventually be used to assign any resulting work order to the referring IIC.

5. If multiple participating IIC's attempt to refer the same customer as a Participating Contractor Referral, the customer will be consulted and will be allowed to choose between the IIC's with whom the customer has signed a PCR form, select any other program IIC, or elect to be assigned to an IIC through the Merit Based Work Allocation System.

6. The customer will be scheduled for a Mass Save Home Energy Assessment and a copy of the PCR will be sent to the scheduled Energy Specialist.

7. The Mass Save Energy Specialist will then develop the weatherization work scope based upon Program rules and the approved Materials Installation Standards.

7. Once finalized, the resulting Work Order will be assigned to the IIC as defined by the process above.

Attachment 8
Insurance and Credentials Requirements

Insurance Requirements

Comprehensive General Liability	Each Occurrence	$ 1,000,000
	General Aggregate	$ 2,000,000
Automobile Liability	Combined Single Limits Per Occurrence	$ 1,000,000
Excess Liability	Each Occurrence	$ 1,000,000
	General Aggregate	$ 1,000,000
Proffessional Liability	General Aggregate	$ 500,000
Worker's Compensation		$ 500,000
Deductibles (not to exceed)		$ 100,000
Tail Coverage		5 years

Independent Installation Contractors (IICs)

Licensing

All Participating IIC's must hold a valid Massachusetts Unrestricted Construction Supervisor's License (CSL) or a valid Massachusetts Insulation Construction Supervisor License (ICSL).

Crew Chiefs

The certified crew chief must be at the job-site throughout the duration of the job. Each crew chief must choose one of the following certification pathways.

1. BPI Crew Chief Certification (Residential Building Envelope Whole House Air Leakage Control Crew Chief Certification)*
2. DOE Weatherization Crew Chief certification*
3. Boot Camp Authorization + Combustion Safety Training (Boot Camp Authorization requires Basic and Advanced Air Sealing Authorizations + Advanced Insulation Authorization)
4. Boot Camp Authorization + BPI Building Analyst Certification (Boot Camp Authorization requires Basic and Advanced Air Sealing Authorizations + Advanced Insulation Authorization)
5. Other RMC-approved training/authorization that demonstrates knowledge of proper air sealing and dense pack techniques, job site management, and combustion safety testing

* = these certifications are not yet available but are expected soon

Crew Members

Crew members are not required to hold any particular weatherization or building science certifications but are encouraged to achieve the following certifications:

1. BPI Installer Certification (Residential Building Envelope Whole House Air Leakage Control Installer Certification)
2. Boot Camp Authorization (especially Basic Air Sealing and Basic Insulation)
3. Any other BPI or DOE or WAP weatherization trainings

Attachment 9

Specified Measures Contractor Agreement

The Mass Save® HES Program goal is to provide the best possible services to customers. Customer satisfaction is a top priority for Berkshire Gas. The Specified Measure Agreements are intended to provide an option for customers who have a unique or difficult site condition that may prevent or hinder work from being performed.

SMAs will be initiated at the energy audit by the Energy Specialists. An SMA will include the customer information and information regarding what the unique or difficult site condition is. This documentation will be included with the job assignment to the CONTRACTOR. The CONTRACTOR should review the information and make a determination if the work can or cannot be completed. Part of this review may require a site visit by the CONTRACTOR. The CONTRACTOR will then complete the work or notify Center for Eco Technology in a timely manner if work cannot be completed.

By signing this agreement to be an SMA contractor the CONTRACTOR agrees to be part of the SMA program for the duration of the active Participation Agreement. It is expected that a CONTRACTOR signing up to be an SMA contractor have the necessary and unique skills to complete the majority of SMA work assignments. While rejection is allowed, the amount of SMA rejections will be reviewed on a regular basis. If excessive rejection without proper justification is determined, a CONTRACTOR may be removed from the SMA program or susceptible to other disciplinary actions. SMA assignments **will not** count against a CONTRACTORS normal allocation amount.

IN WITNESS WHEREOF, the parties have executed this contract as of the Effective Date.
(Effective date being the date of the final signature)

Center for Eco Technology (apply digital signature in the blank space below this line or complete the spaces below)	CONTRACTOR (apply digital signature in the blank space below this line or complete the spaces below)
By: _____ (Signature)	By: _____ (Signature)
Name: _____ (Printed Name)	Name: _____ (Printed Name)
Title: _____	Title: _____
Date: _____	Date: _____

Attachment 10

Duct Sealing & Insulation Contractor Agreement

The Mass Save® HES Program goal is to provide the best possible services to customers. Customer satisfaction is a top priority for Berkshire Gas. Duct sealing and insulation improvements are currently approved measures through the Mass Save program. See Appendix 16.5 of the Mass Save Material and Installation Standard Version 2.0

Duct sealing and insulation will be specified at the energy audit by the Energy Specialists. The Energy Specialist will create contracts based on these specifications and obtain the necessary customer signoffs. These documentations will be included with the job assignment to the CONTRACTOR. The CONTRACTOR should review the information and make a determination if the work can or cannot be completed. Part of this review may require a site visit by the CONTRACTOR. The CONTRACTOR will then complete the work or notify Center for Eco Technology in a timely manner if work cannot be completed.

By signing this agreement the CONTRACTOR agrees to be part of the Duct Sealing & Insulation program for the duration of the active Participation Agreement. It is required that a CONTRACTOR signing up to be a Duct Sealing and Insulation contractor meet the necessary training requirements and have the skills to complete the majority of Duct work assignments.

IN WITNESS WHEREOF, the parties have executed this contract as of the Effective Date.
(Effective date being the date of the final signature)

Center for Eco Technology (apply digital signature in the blank space below this line or complete the spaces below)	CONTRACTOR (apply digital signature in the blank space below this line or complete the spaces below)
By: _____ (Signature)	By: _____ (Signature)
Name: _____ (Printed Name)	Name: _____ (Printed Name)
Title: _____	Title: _____
Date: _____	Date: _____

Attachment 11

CO-BRAND LICENSE AGREEMENT

THIS CO-BRAND LICENSE AGREEMENT ("Agreement") is made and effective as of _____(the "Effective Date") by and between The RCS Network (the "Network"), an unincorporated collaborative association, and _____ ("Provider") (each a "Party and collectively the "Parties").

WHEREAS, Bay State Gas Company d/b/a Columbia Gas of Massachusetts; The Berkshire Gas Company; Boston Gas Company, Colonial Gas Company, Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid; Cape Light Compact JPE; Fitchburg Gas and Electric Light Company d/b/a Unitil; Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty Utilities; and NSTAR Electric Company, NSTAR Gas Company and Western Massachusetts Electric Company, each d/b/a Eversource Energy are the members of the Network (the "Members");

WHEREAS, Network is the owner of the registered service mark "Mass Save", as set forth on Exhibit A hereto (the "Mark") and is also the owner of the service mark as set forth on Exhibit B hereto (the "Partner Mark", collectively with the Mark, the "Mass Save Marks");

WHEREAS, Network desires to develop energy efficiency programs (the "Energy Efficiency Programs") and Provider wishes to use the Partner Mark in association with products and services it offers which promote the Energy Efficiency Programs; and

WHEREAS, Provider recognizes the vital importance of protecting Network's exclusive and valuable rights in and to the Mass Save Marks and the goodwill symbolized thereby.

NOW THEREFORE, in consideration of the mutual promises set forth below and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. **Grant of License.** Subject to the terms and conditions set forth in this Agreement, Network hereby grants to Provider a non-transferable, non-exclusive, revocable license to use the Partner Mark only in Massachusetts (the "Territory") during the Term to promote the Energy Efficiency Programs in accordance with the Mass Save Co-Branding Guidelines as set forth in Exhibit C hereto, which Network may modify from time to time with notice to Provider of such modifications (the "Co-Branding Guidelines").

2. **Term.** The initial term of this Agreement shall be for a period of one (1) year (the "Initial Term"), commencing as of the Effective Date. Unless written notice of intent not to renew this Agreement is given by either Party to the other Party at least sixty (60) days before the end of the then-current term, in which case the Agreement shall terminate at the end of the then-current term, the term of this Agreement will automatically be extended for successive one-year terms (each, a "Renewal Term" and collectively with the Initial Term, the "Term") upon the same terms and conditions as the then-current Term, unless otherwise amended upon mutual written agreement of the Parties or terminated in accordance with this Agreement.

3. **Restrictions.** Except as expressly provided in this Agreement, Provider will not: (a) transfer, sell, license, sublicense, distribute or commercially exploit the Mass Save Marks or (b) modify, reproduce, create derivative or collective works from, or in any way otherwise exploit the Mass Save Marks in whole or in part.

4. **Ownership.** Network owns all rights in the Mass Save Marks and reserves the right to use the Mass Save Marks and license the Mass Save Marks to other persons or entities, and no provision of this Agreement shall be construed to effect any present or future transfer of title or other rights not otherwise granted hereunder, to Provider of any of the Mass Save Marks or other property of the Network. All use of the Partner Mark by Provider inures to the benefit of Network. Provider acknowledges and agrees that Network owns all right, title, and interest in and to the Mass Save Marks worldwide. Provider recognizes that Network would suffer irreparable injury by unauthorized use of the Mass Save Marks and agrees that injunctive and other equitable relief is appropriate in the event of Provider's breach of the terms of the license granted hereunder. Such remedy shall not be exclusive of any other remedies available to Network, nor shall it be deemed an election of remedies by Network.

5. **Provider Commitments.**

   a. Provider commits to fulfill the eligibility requirements set forth on Exhibit D hereto, which Network may modify from time to time with notice to Provider of such modifications (the "Program Requirements") and to work in good faith towards fulfilling the requirements of the Energy Efficiency Programs.

   b. Provider shall use the Partner Mark to promote the Energy Efficiency Programs and heighten public awareness of the Mass Save brand and campaign.

   c. Provider shall comply with the Co-Branding Guidelines.

6. **Quality Control of Usage of Mark.**

   a. All uses of the Partner Mark must appear identical in substance to the Partner Mark as it appears on Exhibit B. All uses of the Partner Mark shall comply with the then current Co-Branding Guidelines.

   b. Prior to any use of the Partner Mark, Provider must obtain, at Provider's sole expense, prior written approval of such use by an authorized agent of a Member (an "Authorized Agent"). Such request shall include a representative sample of the proposed use of the Partner Mark, including, but not limited to, advertising or other promotional materials, signs, packaging, and/or labels.

   c. In addition to the requirement for new uses set forth in 6(b) above, every six months following approval by an Authorized Agent as provided for in Section 6(b) above, Provider shall submit examples of Provider's use of the Partner Mark to the Authorized Agent.

d. If Network determines that one or more of Provider's uses of the Partner Mark is in any manner inconsistent with the terms of this Agreement, including any exhibits hereto, then Network shall so notify Provider, and Provider shall immediately cease all such disapproved uses of the Partner Mark. Failure of Provider to comply with Network's instructions shall result in the immediate termination of the Agreement.

7. **Disclaimers.** Provider will not construe, claim, or imply that its use of the Partner Mark constitutes Network's or its Members' approval, acceptance, or endorsement of anything other than Provider's commitment to the Energy Efficiency Programs. Provider shall not use the Partner Mark to misrepresent its relationship with the Network or its Members. THE PROVIDER UNDERSTANDS THAT EXCEPT AS EXPRESSLY PROVIDED HEREIN, NETWORK MAKES NO OTHER REPRESENTATIONS, WARRANTIES OR GUARANTEES IN CONNECTION WITH THE MASS SAVE MARKS, THIS AGREEMENT OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND PROVIDER ACKNOWLEDGES THAT NETWORK SHALL HAVE NO RESPONSIBILITY OR LIABILITY FOR ANY WORK, PRODUCTS, GOODS, SERVICES OR ANY OTHER ITEMS IN CONNECTION WITH THE USE OF PARTNER MARK BY THE PROVIDER. THIS DISCLAIMER SHALL SURVIVE ANY CANCELLATION, COMPLETION, TERMINATION OR EXPIRATION OF THIS AGREEMENT. THE TERMS OF THIS SECTION SHALL GOVERN OVER ANY CONTRARY VERBAL STATEMENTS OR LANGUAGE APPEARING IN ANY NETWORK OR OTHER DOCUMENTS.

8. **Entry into Force, Termination and Duration of Agreement.** This Agreement shall be effective as of the Effective Date. This Agreement may be terminated immediately by either Party at any time, and for any reason, with no penalty, by providing written notice to the other Party. Upon such termination, Provider shall immediately cease using the Partner Mark in any manner, provided, however, that Provider shall have thirty (30) days to remove any uses already in- market, upon notice of termination, if such termination was for convenience and not for Cause (as defined below). For purposes of this Agreement, "Cause" shall mean a material breach of any term of this Agreement by Provider, or any act or omission of Provider that is contrary to the business interests, reputation, or goodwill of the Network or any of its Members. In the event of a termination by Network for Cause, Provider shall make a good faith effort to remove all uses of the Partner Mark within five (5) business days of notice of termination.

9. **Limitations of Liability and Consequential Damages.** IN NO EVENT WHETHER BASED UPON CONTRACT, INDEMNITY, WARRANTY, TORT (INCLUDING NEGLIGENCE) STRICT LIABILITY OR OTHERWISE WILL NETWORK OR ITS MEMBERS BE LIABLE FOR: (A) DAMAGES CAUSED BY ANY SERVICES OR PRODUCTS OFFERED BY PROVIDER, (B) DAMAGES FOR DESTRUCTION OF PROPERTY OR PERSONAL INJURY (INCLUDING, BUT NOT LIMITED TO DEATH) OR (C) INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES.

The invalidity, in whole or part, of any of the foregoing paragraph will not affect the remainder of such paragraph. The limitations and disclaimers are intended to apply to the fullest extent permitted by law, and the invalidity of application thereof to any given circumstance will not affect such application to any other circumstance. Such limitations and disclaimers are intended to prevail over any provision in this Agreement to the contrary**.**

10. Release. To the fullest extent allowed by law, Provider does hereby release and discharge, on behalf of itself and its successors, Network and its Members, and its Members' directors, officers, employees and agents of and from all actions, suits, debts, contracts, damages, liens, claims, and demands of every kind and nature whatsoever which the Provider ever had or now has arising out of any matter relating to this Agreement.

11. Indemnity. Provider agrees to indemnify and defend Network and each of its Members, and each of its Members' directors, officers, employees and agents and hold each of them harmless from and against any and all claims, demands, actions, liabilities, damages, losses, costs and expenses (including attorneys' fees) (collectively, "Damages") arising out of or resulting from or in connection with Provider's (a) performance or non-performance or other breach of its obligations under this Agreement; or (b) negligent or willful acts or omissions (or such actions or omissions of Provider's agents, employees, contractors, or consultants); or (c) personal injuries (including, but not limited to, death) or property damage or any other damage claimed and/or suffered by any person or entity. This Section shall survive the expiration or termination of this Agreement.

12. Miscellaneous.

a. **Governing Law and Jurisdiction; Good Faith Efforts to Resolve Disputes.** This Agreement will be governed by and construed in accordance with the applicable laws of the United States and of the Commonwealth of Massachusetts, without regard to Massachusetts' principles of, or conflicts of law rules. All legal action involving any disputes arising under or relating to this Agreement will be brought and heard only in a court of the Commonwealth of Massachusetts or in the United States District Court located in Massachusetts. The Parties waive a trial by jury with respect to any dispute or controversy under this Agreement. The provisions of this Section 12(a) shall survive the termination or expiration of this Agreement. In the event of a controversy, claim or dispute ("Dispute") arising out of or relating to this Agreement, the Parties shall endeavor, in good faith, to expeditiously negotiate a resolution mutually agreed by the Parties.

b. Integration and Amendment. This Agreement contains the complete agreement between the Parties. All previous and collateral agreements, written or verbal, relating to the subject matter of this Agreement are superseded by this Agreement. The Exhibits referenced in this Agreement are an integral part of this Agreement and are incorporated herein. Any understanding, promise, representation, warranty or condition not incorporated in this Agreement will not be binding on either Party. This Agreement may only be amended by a writing signed by both Parties. The recitals stated above are true and correct and are expressly incorporated herein by this reference.

c. **Waiver.** Waiver by a Party of any default by the other Party will not be deemed a waiver of (i) any other default irrespective of whether such default is similar or (ii) a right at any time thereafter to require exact and strict compliance with the terms of this Agreement.

d. **No Third Party Benefits.** This Agreement is entered into solely for the respective benefit of the Parties (and the underlying Members with respect to the Network) to this Agreement, and nothing in this Agreement will be construed as giving any entity other than the Parties to this Agreement any right, remedy or claim under this Agreement.

e. **No Agency.** Nothing in this Agreement shall create a partnership, joint venture, employment, or establish the relationship of principal and agent or any other relationship of a similar nature between the Parties.

f. **Severability.** If any term or condition of this Agreement is adjudged to be illegal or unenforceable, all other terms will remain in force, and the term or condition held illegal or unenforceable will remain in effect as far as possible in accordance with the intention of the Parties as applied to any circumstance.

g. **Assignment.** The Provider shall not assign this Agreement or any part thereof or any rights or obligations hereunder without the prior written consent of Network. Any assignment of the Agreement by the Provider in violation of the foregoing shall be null and void.

h. **Counterparts.** This Agreement may be executed in counterparts, including counterparts transmitted electronically or by facsimile, each of which will be deemed an original, and all such counterparts will constitute one and the same agreement.

i. **Notices.** Any notice to be given under this Agreement will be in writing, will be deemed given upon receipt, and will be delivered in person, by registered or certified mail, postage prepaid, return receipt requested, or by overnight delivery service with proof of delivery and addressed as follows, or by electric mail upon acknowledgment of receipt of electronic transmission by recipient.

If to RCS Network:

The RCS Network
c/o Emmett E. Lyne, Esq.
Rich May, P.C.
176 Federal Street
Boston, MA 02110
elyne@richmaylaw.com

If to Provider:

At the address set forth below such Provider's name on the signature pages to this Agreement.

Attachment 11

IN WITNESS WHEREOF, duly authorized representatives of the Parties have executed this Agreement under seal as of the date first written above.

Provider

By: _____

Name: _____

Title: _____

Address: _____

_____

THE RCS NETWORK

By: _____
Program Administrator

By: _____

Name:

_____

Title:

_____

Attachment 11

EXHIBIT A
Registered Service Marks of Network

MASS SAVE

Word Mark: MASS SAVE
Registration Number: 3136287

mass save

Word Mark: MASS SAVE
Registration Number: 4064339

mass save
Savings through energy efficiency

Word Mark: MASS SAVE SAVINGS THROUGH ENERGY EFFICIENCY
Registration Number: 3937305

Attachment 11

EXHIBIT B
Partner Mark

Attachment 11

EXHIBIT C
Co-Branding Guidelines

Attachment 11

9/15/2017

MASS SAVE® PARTNER BRAND IDENTITY GUIDELINES

For Approved Third Parties

mass save
Savings through energy efficiency

Attachment 11

Table of Contents

Using these Guidelines

Why have these guidelines been created?

The following guidelines have been created to provide a basic understanding of how to correctly and effectively use the Mass Save identity. By accurately implementing these guidelines you are protecting and promoting the integrity of the Mass Save brand.

Who should use these guidelines?

The program administrators, marketing partner consultants, and approved third parties who promote the Mass Save brand and its energy efficiency programs.

What if I leave the program?

If you were authorized to use the Partner logo and are no longer in the program, you have 30 days to remove the logo from your materials, including your website, truck, etc.

Note: *All* materials carrying the Mass Save logo must obtain approval prior to use.

Every application of the logo must be approved by the designated Mass Save Agent before usage. This pertains to all ads and materials where the logo is displayed.

Please email Rachel Gage at rgage@ksvc.com for access to and approval of all Mass Save artwork.

Throughout these guidelines, a placeholder logo is being used to illustrate where the third party logo should go.

Logo with Tagline

MINIMUM SIZE

To ensure legibility, the logo with tagline should not be reduced to less than 1.75 inches wide.

USAGE

External promotional materials, advertising, direct mail, giveaways, press releases, videos, intranet, extranet, website, brochures, case studies, sector sheets, external forms, PowerPoint presentations, and signage.

Full-color

Greyscale

One-color

One-color

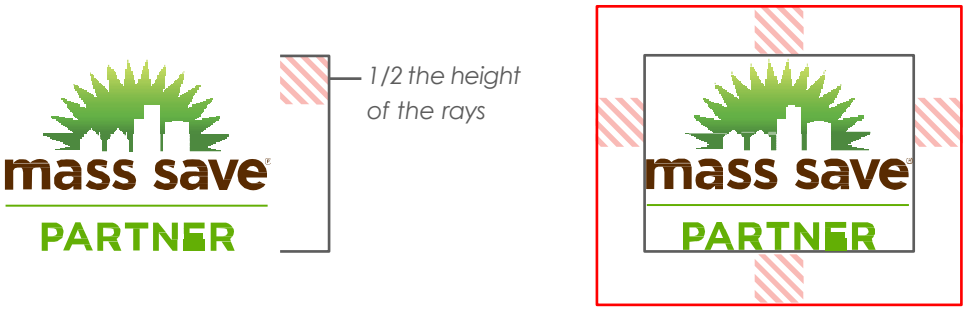
Black

Reverse

Logo Guidelines

SAFE AREA

To ensure the logo is not crowded by other design elements, use a safe area of half the height of the graphic rays. Do not place any type or images within this safe area.



USAGE RULES

- Always scale the logo proportionately. Never distort or stretch it.
- Never use the logo with any colors other than the approved colors listed in this guide.
- Never have the location of the approved colors changed within the logo elements.
- Never use the full color version of the logo on a dark or colored background. Always use the white version of the logo in this case.
- Never use the logo on a complex background.

INCORRECT USAGE EXAMPLES

Logo Color Palette

Use Pantone or CMYK values for printed pieces, RGB values for digital pieces, and Hex colors for HTML coding in website design.

PANTONE 732 PC
C16 **M**68 **Y**100 **K**70
R89 **G**43 **B**2
HEX 592b02

PANTONE 370 PC
C64 **M**5 **Y**100 **K**24
R100 **G**176 **B**6
HEX 64b006

Gradient
Use the full-color logo version; never re-create the gradient.

mass save®
PARTNER

Design Color Palette

Use Pantone or CMYK values for printed pieces, RGB values for digital pieces, and Hex colors for HTML coding in website design.

Primary

PANTONE 732 PC
C16 **M**68 **Y**100 **K**70
R89 **G**43 **B**2
HEX 592b02

PANTONE 370 PC
C64 **M**5 **Y**100 **K**24
R100 **G**176 **B**6
HEX 64b006

PANTONE 381 PC
C23 **M**0 **Y**89 **K**0
R192 **G**229 **B**89
HEX c0e559

Secondary

PANTONE 425 PC
C38 **M**28 **Y**21 **K**63
R93 **G**93 **B**93
HEX 5d5d5d

PANTONE 470 PC
C8 **M**68 **Y**94 **K**34
R148 **G**78 **B**17
HEX 924e11

PANTONE 2925 PC
C84 **M**21 **Y**0 **K**0
R40 **G**127 **B**242
HEX 287ff2

PANTONE 600 PC
C6 **M**1 **Y**39 **K**0
R242 **G**236 **B**174
HEX f2eeae

PANTONE Black PC
C0 **M**0 **Y**0 **K**100
R0 **G**0 **B**0
HEX 000000

White
C0 **M**0 **Y**0 **K**0
R255 **G**255 **B**255
HEX ffffff

Typeface

MINIMUM SIZE

Body copy size is preferred at 10 – 12pt, and should never to be smaller than 8pt (unless legal copy is included). Legal copy should never to be smaller than 5.5pt.

USAGE

The entire font family for Arial can be used in all marketing materials.

Arial Regular

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 #$%&

Arial Bold

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890 #$%&

Boiler Plate

USAGE

Boiler plate should be used in the body of press releases and on the backs of brochures (where it is titled ABOUT MASS SAVE).

BOILER PLATE COPY

Mass Save is a collaborative of Massachusetts' natural gas and electric utilities and energy efficiency service providers, including Berkshire Gas, Blackstone Gas Company, Cape Light Compact, Columbia Gas of Massachusetts, Eversource, Liberty Utilities, National Grid and Unitil. We empower residents, businesses, and communities to make energy efficient upgrades by offering a wide range of services, rebates, incentives, trainings, and information.

Post Card

LOGO USAGE

The third party logo should be sized approximately 125% larger than the Mass Save logo.

front

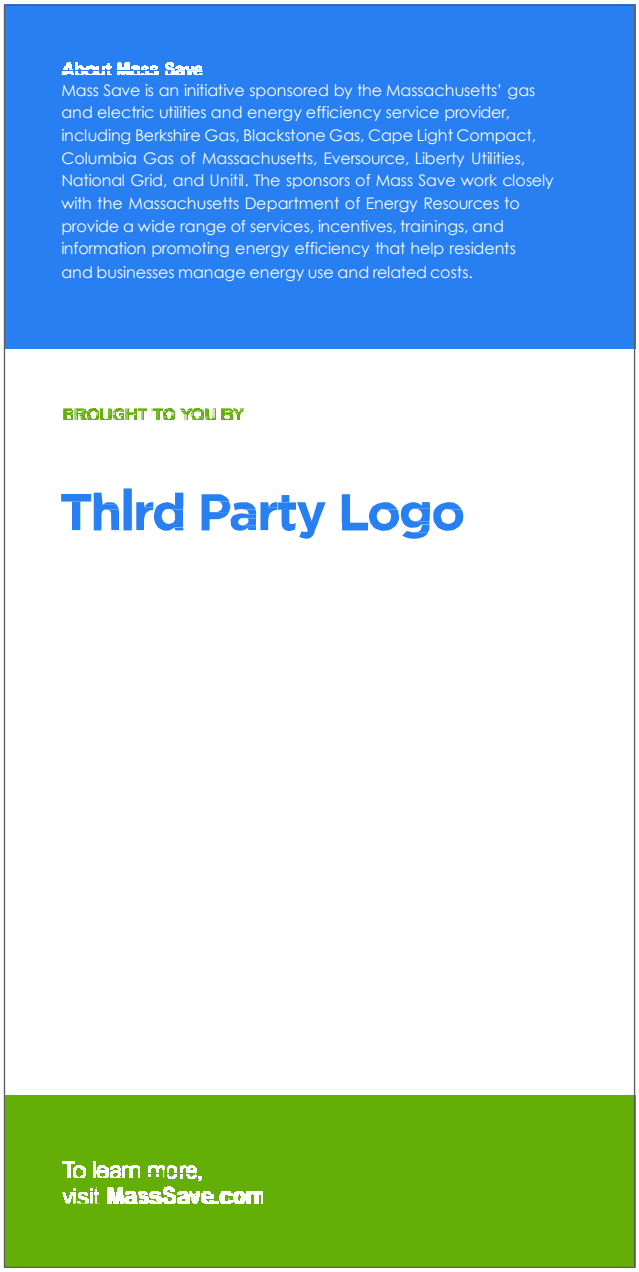
back

Brochure

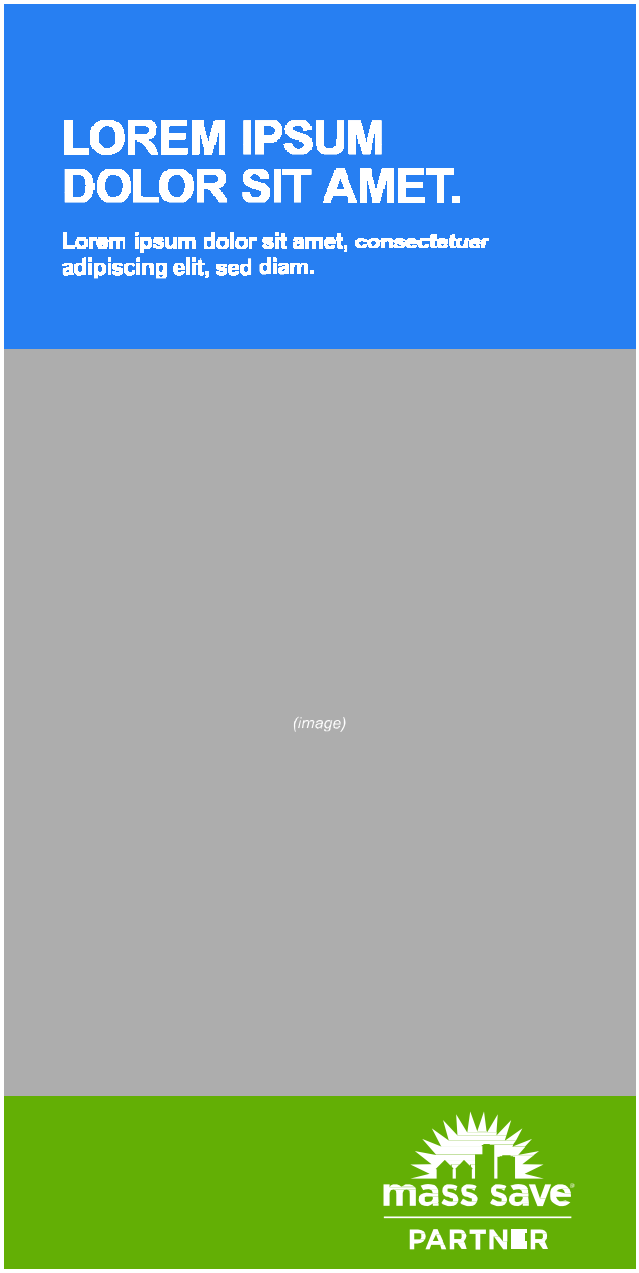
LOGO USAGE

The third party logo should be sized approximately 125% larger than the Mass Save logo.

back



front



Full-Page Ad

LOGO USAGE

The third party logo should be sized approximately 125% larger than the Mass Save logo.

Horizontal Half-Page Ad

LOGO USAGE

The third party logo should be sized approximately 125% larger than the Mass Save logo.

Vertical Half-Page Ad

LOGO USAGE

The third party logo should be sized approximately 125% larger than the Mass Save logo.

Vehicle Magnet & Truck Wrap

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art on the vehicle magnet, leaving at least a 1.00 inch space on either side.

You may use the Mass Save logo on your truck wrap beside non-Mass Save offers, as long as Mass Save offers are also present, such as those for insulation, energy assessment, etc.

T-Shirt (Screen-Printing)

LOGO USAGE

Actual art size (including both logos) should never exceed 8" in width. Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art over the chest.

Third Party Logo | mass save PARTNER

Polo Shirt (Embroidery)

LOGO USAGE

Actual art size (including both logos) should never exceed 3" wide. Place the embroidery art over the left chest. Use the Mass Save logo without tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line.

Third Party Logo | mass save PARTNER

Tote Bag

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos andthe dividingline. Center art onthetotebag, leaving atleasta 1.ooinchspace on either side.

Coffee Mug

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art on the mug, leaving at least a 1.00 inch space on either side.

Third Party Logo | mass save PARTNER

left side *head on* *right side*

Water Bottle

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Place art vertically (reading up) and center it on one side of the water bottle, leavingatleast a 1.ooinch space on either side.

Mouse Pad

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art on the mouse pad, leaving at least a 1.00 inch space on either side.

Pen

LOGO USAGE

Use the Mass Save logo without tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art on the pen, leaving at least a .5 inch space on either side.

Third Party Logo | mass save PARTNER

Magnet

LOGO USAGE

Use the Mass Save logo without tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art on the magnet, leaving at least a .375 inch spaceon eitherside.

Standard magnet size is 3.5 x 2"

Web Logo Usage

MINIMUM LOGO SIZE

To ensure legibility, the logo with tagline should not be reduced to less than 1.75 inches wide.

LOGO USAGE

In a web environment, the logo should link to the Mass Save website:
http://www.masssave.com/

Web Banner Ad

LOGO USAGE

Use the Mass Save logo with tagline in solid green (color match **PANTONE** 370 PC or **C**64 **M**5 **Y**100 **K**24) and scale it to approximately half the size of the third party logo. Divide the two logos with a 1pt light green vertical line (color match **PANTONE** 381 PC or **C**23 **M**0 **Y**89 **K**0). Align the vertical centers of both logos and the dividing line. Center art in the banner ad space, leaving at least a .25 inch space on all sides.

EXHIBIT D
Program Requirements

EXHIBIT D-1
Mass Save MANUFACTURER Partner Eligibility Requirements

1. Manufacturer has current right to use the ENERGY STAR label on each product as determined by the U.S. Environmental Protection Agency ("EPA"). Manufacturer agrees to comply with all EPA Energy Star certification requirements throughout the term of the Co-Brand License Agreement.

2. Manufacturer offers products for sale in Massachusetts. Partner Mark may only be used in Massachusetts.

3. Manufacturers shall obtain insurance coverage as follows:

    a. Manufacturer shall obtain insurance coverage from a reputable insurance carrier acceptable to Network in order to protect and insure Network and Manufacturer against any claims or liabilities with which either or both of them may be charged because of personal injuries or injuries suffered by any person or entity, resulting from the any product or service offered by Manufacturer or any other act of Manufacturer. Such insurance will have limits not less than (per person, per injury) and deductibles and/or self-insurance retentions consistent with Manufacturer's then-current insurance programs and policies during the period in which Manufacturer is authorized to use the Partner Mark and at least five (5) years thereafter.

    b. Each Member of the Network or the individual Program Administrator executing this Agreement (the "signatory PA") shall be named in the policy of such insurance as an additional insured; provided, however, that the signatory PA shall indemnify all the other Members of the Network in a separate indemnification agreement covering cases in which the insurance only names the signatory PA. Each insurance policy shall provide that the insurance cannot be cancelled without the insurer giving the signatory PA written notice thereof at least thirty (30) days prior to the effective date of the cancellation and that the insurance covers the contractual liability of Manufacturer to each Member of the Network or the signatory PA under the provisions of the Co-Brand License Agreement. Manufacturer shall maintain such insurance in full force and effect throughout the Term of the Co-Brand License Agreement and for at least five (5) years thereafter. Within ten (10) days after the date this Agreement is executed, Manufacturer shall deliver to the signatory PA a certificate of insurance evidencing that such insurance is in full force and effect and that it cannot be cancelled without the insurer giving the signatory PA written notice thereof at least thirty (30) days prior to the effective date of the cancellation. The insurance described in this Section shall be primary and shall not be subject to contribution by any other insurance which may be available to Manufacturer.

EXHIBIT D-2

Mass Save VENDOR Partner Eligibility Requirements

1. Vendor will complete attached application for partnership.

2. Vendor's application must be approved by the Members of Network who work with the vendor.

3. Vendor shall comply with the following insurance requirements:

    a. Vendor shall obtain insurance coverage, including but not limited to general liability insurance, worker's compensation insurance and automobile liability insurance, as specified by the Program Administrator with whom it is under contract, from a reputable insurance carrier acceptable to Network in order to protect and insure Network and Vendor against any claims or liabilities with which either or both of them may be charged because of personal injuries or injuries suffered by any person or entity, resulting from the any product or service offered by Vendor or any other act. Such insurance will have limits not less than_____(per person, per injury) and deductibles and/or self-insurance retentions consistent with Vendor's then-current insurance programs and policies during the period in which Vendor is authorized to use the Partner Mark and at least five (5) years thereafter.

    b. Each Member of the Network or the individual Program Administrator executing this Agreement (the "signatory PA") shall be named in the policy of such insurance as an additional insured provided, however, that the signatory PA shall indemnify all the other Members of the Network in a separate indemnification agreement covering cases in which the insurance only names the signatory PA. Each insurance policy shall provide that the insurance cannot be cancelled without the insurer giving the signatory PA written notice thereof at least thirty (30) days prior to the effective date of the cancellation and that the insurance covers the contractual liability of Vendor to each Member of the Network or the signatory PA under the provisions of the Co-Brand License Agreement. Vendor shall maintain such insurance in full force and effect throughout the Term and for at least five (5) years thereafter. Within ten (10) days after the date the Co-Brand License Agreement is executed, Vendor shall deliver to the signatory PA a certificate of insurance evidencing that such insurance is in full force and effect and that it cannot be cancelled without the insurer giving the signatory PA written notice thereof at least thirty (30) days prior to the effective date of the cancellation. The insurance described in this section shall be primary and shall not be subject to contribution by any other insurance, which may be available to Vendor.

4. Vendor agrees to destroy all shirts containing the Partner mark upon the termination of this Agreement. Vendor further agrees to require all employees leaving Vendor's employment to return all shirts containing the Partner Logo to the Vendor.

VENDOR APPLICATION

Company Information:

Name: _____ Phone: _____

Address: _____ Email: _____

_____ Website: _____

Questions:

1. Company Contact: _____

   Phone: _____

   Email: _____

2. Number of years in business: _____
3. Number of years participating in Mass Save Programs: _____
4. Which Mass Save Programs:

   _____

   _____

   _____

5. List and describe lawsuits or other actions or reprimands:

   _____

   _____

   _____

6. List and describe any energy efficiency related trainings or certificates:

   _____

   _____

   _____

7. Attach copy of insurance certificates

EXHIBIT D-3

Mass Save NONPROFIT Partner Eligibility Requirements

1. Nonprofit organization is in good standing in Commonwealth of Massachusetts

2. Nonprofit's mission includes the promotion of energy efficiency

3. No outstanding lawsuits exist against the nonprofit except as reviewed and approved by an Authorized Agent prior to use of the Partner Mark.

4. Nonprofit will only use licensed subcontractors who meet all the requirements set forth in Exhibit D-2 herein.

EXHIBIT D-4

Mass Save LENDER Partner Eligibility Requirements

1. Lender is a state or federally chartered banking institution or credit union.

2. Lender is engaged in business of consumer lending and holds all necessary licenses to conduct such business in the Commonwealth of Massachusetts.

3. Lender is currently a party to at least one of the following fully executed agreements: MASS SAVE RESIDENTIAL HEAT LOAN SUBSIDY AGREEMENT or MASS SAVE COMMERCIAL & INDUSTRIAL LOAN SUBSIDY AGREEMENT (the "Agreements").

4. Lender is in full compliance with the terms and conditions of the Agreements.

EXHIBIT D-5
Mass Save RETAILER Partner Eligibility Requirements

1. Retailer acknowledges and agrees that is being granted the right to use the Partner Logo only to promote MASS SAVE ENERGY STAR approved products.

2. Retailer sells products containing the ENERGY STAR label as determined by the U.S. Environmental Protection Agency ("EPA").

3. Retailer offers products for sale in Massachusetts. Partner Mark may only be used in Massachusetts.

4. Retailer has been approved by the MASS SAVE Lighting and Products Group.

5. Retailer has indemnification agreements with the manufacturers of the ENERGY STAR products Retailer sells.