2011 ENTERPRISE GREEN COMMUNITIES
SINGLE FAMILY REHABILITATION SPECIFICATIONS
About Enterprise Green Communities
Enterprise Green Communities is the first national green building program focused entirely on affordable housing. Launched by Enterprise in fall 2004, Green Communities is designed to help developers, investors, builders and policymakers make the transition to a greener future for affordable housing. Visit www.greencommunitiesonline.org

About Enterprise
Enterprise is a leading provider of the development capital and expertise it takes to create decent, affordable homes and rebuild communities. For nearly 30 years, Enterprise has introduced neighborhood solutions through public–private partnerships with financial institutions, governments, community organizations and others that share our vision. Enterprise has raised and invested more than $10.6 billion in equity, grants and loans to help build or preserve more than 270,000 affordable rental and for-sale homes to create vital communities. Enterprise is currently investing in communities at a rate of $1 billion a year. Visit www.enterprisecommunity.org to learn more about Enterprise’s efforts to build communities and opportunity.
# TABLE OF CONTENTS

## Introduction

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

## CONSIDERATIONS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

## SUBSTITUTION APPROVAL PROCESS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

## ACRONYMS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

## SINGLE FAMILY SPECIFICATION LEGEND

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

## General Requirements

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

7 / GREEN COMMUNITIES INITIATIVE — GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

24 / MANUFACTURER’S SPECS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

132 / ACCESSIBILITY — FULLY ACCESSIBLE UNIT

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

134 / ACCESSIBILITY — ACCESSIBLE ENTRY

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

136 / ACCESSIBILITY REQUIREMENTS — COMPONENT REPLACEMENT

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

138 / ADAPTABILITY — BLOCKING WITH ACCESS TO FRAMING

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

28 / VENTILATION — ASHRAE 62.2 GENERAL REQUIREMENTS — 2011 GCI

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

9008 / RRP REQUIREMENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

9003 / LEAD-SPECIFIC LAWS, RULES, REGULATIONS, AND GUIDELINES

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

9020 / LEAD-BASED PAINT REGULATIONS — FEDERALLY FUNDED HOUSING REHABILITATION

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

32 / SUBSTITUTION APPROVAL PROCESS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

## Universal Design

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

3937 / FIXED SIDE AND REAR WALL GRAB BARS — COMMODE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

3940 / TUB AND SHOWER GRAB BAR SET

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

3938 / FOLD-UP GRAB BAR — COMMODE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

## Site Improvements

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

427 / TREE — PLANT

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

550 / REGRADE FOUNDATION

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

417 / RESEED — FINE FESCUE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

## Water Conservation

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

4667 / STORM DRAIN LABELS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

7012 / COMMODE — REPLACE WITH 1.28 GPF

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

7014 / COMMODE — REPLACE WITH DUAL FLUSH

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

7016 / COMMODE — REPLACE WITH 1.2 GPF

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

6935 / SHOWER HEAD — 2 GPM

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

6830 / SINK — SINGLE BOWL COMPLETE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

6835 / SINK — DOUBLE BOWL COMPLETE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

6810 / FAUCET — KITCHEN SINGLE-LEVER 2.0 GPM

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

6875 / FAUCET — LAVATORY SINGLE-LEVER 1.5 GPM

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

7181 / BATH — 3-FIXTURE COMPLETE — GCI

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

7183 / BATH FIXTURES — ADVANCED WATER SAVING

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

6958 / BATHTUB/SHOWER — 5-FOOT FIBERGLASS — COMPLETE, ADAPTABLE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

6960 / BATHTUB/SHOWER — 5-FOOT FIBERGLASS — COMPLETE WITH GRAB BARS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
</tr>
</tbody>
</table>

8491 / DISHWASHER — TWO-CYCLE

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
</tr>
</tbody>
</table>

8510 / ENERGY START ASHER-DRYER — STACKED

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
</tr>
</tbody>
</table>
### Energy Efficiency

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4903</td>
<td>Air-seal building envelope</td>
</tr>
<tr>
<td>7744</td>
<td>Replace recessed light fixture</td>
</tr>
<tr>
<td>4904</td>
<td>Air-seal — isolate garage</td>
</tr>
<tr>
<td>4906</td>
<td>Insulate rim joist — foam</td>
</tr>
<tr>
<td>4907</td>
<td>Insulate rim joist — foam board</td>
</tr>
<tr>
<td>4905</td>
<td>Insulate wall — R-13 Kraft faced batt</td>
</tr>
<tr>
<td>4906</td>
<td>Insulate wall — R-13 unfaced batt</td>
</tr>
<tr>
<td>4910</td>
<td>Insulate wall — R-19 Kraft faced batt</td>
</tr>
<tr>
<td>4911</td>
<td>Insulate wall — R-19 unfaced batt</td>
</tr>
<tr>
<td>4908</td>
<td>Wall insulation — dense pack cellulose</td>
</tr>
<tr>
<td>4922</td>
<td>Wall insulation — dense pack fiberglass</td>
</tr>
<tr>
<td>4909</td>
<td>Wall insulation — damp spray cellulose 2 x 4 wall</td>
</tr>
<tr>
<td>4918</td>
<td>Insulate ceiling, R-30 unfaced batt</td>
</tr>
<tr>
<td>4920</td>
<td>Insulate ceiling, R-30 Kraft faced batt</td>
</tr>
<tr>
<td>4935</td>
<td>Attic insulation — cellulose — dense pack</td>
</tr>
<tr>
<td>4937</td>
<td>Attic R-30 cellulose</td>
</tr>
<tr>
<td>4912</td>
<td>Insulate wall, ceiling, floor cavity — closed cell foam</td>
</tr>
<tr>
<td>8137</td>
<td>Update existing electric — bathroom</td>
</tr>
<tr>
<td>7819</td>
<td>Energy star fan / light fixture</td>
</tr>
<tr>
<td>7752</td>
<td>Energy star interior ceiling fixture</td>
</tr>
<tr>
<td>7753</td>
<td>Energy star interior wall fixture</td>
</tr>
<tr>
<td>7761</td>
<td>Energy star 2-bulb bath vanity fixture</td>
</tr>
<tr>
<td>7763</td>
<td>Energy star 3-bulb bath vanity fixture</td>
</tr>
<tr>
<td>7751</td>
<td>Energy star kitchen ceiling fixture</td>
</tr>
<tr>
<td>8168</td>
<td>Replace exterior light fixture</td>
</tr>
<tr>
<td>7744</td>
<td>Replace recessed light fixture</td>
</tr>
<tr>
<td>7757</td>
<td>CFL replacement lamp</td>
</tr>
<tr>
<td>6041</td>
<td>Replace furnace 90+ gas</td>
</tr>
<tr>
<td>6175</td>
<td>Heat pump — replace — 16 seer</td>
</tr>
<tr>
<td>6176</td>
<td>Replace heat pump — 13 seer</td>
</tr>
<tr>
<td>6337</td>
<td>Duct sealing</td>
</tr>
<tr>
<td>6339</td>
<td>Return air transfer grill (12&quot; x 6&quot;)</td>
</tr>
<tr>
<td>6340</td>
<td>Return air transfer grill (12&quot; x 12&quot;)</td>
</tr>
<tr>
<td>6244</td>
<td>Boiler — high efficiency — gas replace</td>
</tr>
<tr>
<td>6246</td>
<td>Boiler — high efficiency — gas replace complete</td>
</tr>
<tr>
<td>6247</td>
<td>Boiler — high efficiency — with indirect water heater</td>
</tr>
<tr>
<td>7077</td>
<td>Water heater — 40-gallon gas — power vented</td>
</tr>
<tr>
<td>7079</td>
<td>Water heater — 50-gallon gas — power vented</td>
</tr>
<tr>
<td>7081</td>
<td>Water heater — 50-gallon gas (95+) — power vented</td>
</tr>
<tr>
<td>7082</td>
<td>Water heater — 50-gallon with heat pump</td>
</tr>
<tr>
<td>7083</td>
<td>Water heater — tankless</td>
</tr>
</tbody>
</table>

### Materials Beneficial to the Environment

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>739</td>
<td>Reuse building component</td>
</tr>
<tr>
<td>741</td>
<td>Salvage building component for recycling</td>
</tr>
<tr>
<td>798</td>
<td>Disposal — recycle construction waste</td>
</tr>
</tbody>
</table>
Healthy Living Environment

5568 / PREP AND PAINT VACANT ROOM WITH NATURAL TRIM — LOW-VOC .......................................................... 32
5567 / PREP AND PAINT VACANT ROOM WITH PAINTED TRIM — LOW-VOC ......................................................... 32
5610 / COLD CLIMATE VAPOR BARRIER PRIMER — LOW-VOC .............................................................................. 33
5677 / PREP AND PAINT EXTERIOR TRIM — LOW-VOC ............................................................................................. 33
5971 / CARPET (BERBER) AND PAD — GREEN LABEL ............................................................................................. 33
5972 / CARPET (CUT PILE) AND PAD — GREEN LABEL ............................................................................................. 33
5982 / CARPET AND PAD STAIRS — GREEN LABEL .............................................................................................. 34
5917 / UNDERLAYMENT AND LINOILEUM COMPOSITION TILE .............................................................................. 34
5918 / UNDERLAYMENT AND BIOBASED COMPOSITION TILE ............................................................................... 34
5922 / UNDERLAYMENT AND LINOILEUM SHEET GOODS .......................................................................................... 34
2351 / FLOOR — REFINISH WOOD LOW-VOC ............................................................................................................. 34
3716 / CABINET — WOOD BASE — PLYWOOD ........................................................................................................ 35
3726 / CABINET — WOOD WALL — PLYWOOD .......................................................................................................... 35
3717 / CABINET — WOOD BASE ............................................................................................................................... 35
3727 / CABINET — WOOD WALL .................................................................................................................................. 35
3747 / REPLACE COUNTERTOP — PLASTIC LAMINATE ............................................................................................. 36
2040 / RADON — VENT CONCRETE SLAB (PASSIVE) ................................................................................................. 36
2041 / RADON — VENT CONCRETE SLAB — SUMP (PASSIVE) ....................................................................................... 36
2042 / RADON — SEAL, VENT, INSULATE CRAWL SPACE (PASSIVE) ...................................................................... 36
2043 / RADON — MAKE PASSIVE SYSTEM ACTIVE .................................................................................................. 37
8395 / INTEGRATED PEST MANAGEMENT .................................................................................................................. 37
7836 / ENERGY STAR KITCHEN RANGE HOOD — VENTED .................................................................................. 37
7819 / ENERGY STAR FANLIGHT FIXTURE .................................................................................................................. 37
7821 / ENERGY STAR FANLIGHT FIXTURE — CONTINUOUS WITH MOTION ACTIVATED BOOST ........................... 38
7822 / ENERGY STAR FANLIGHT FIXTURE — CONTINUOUS WITH SWITCH ACTIVATED Boost ................................. 38
7823 / EXHAUST FAN WITH CONTINUOUS MODULATING — MOTION DETECTOR SWITCH ................................. 38
7824 / EXHAUST FAN WITH CONTINUOUS SWITCH ACTIVATED BOOST — GCI ...................................................... 39
6042 / ACTIVE FRESH AIR INTAKE — FORCED AIR SYSTEM — APRILAIRE .............................................................. 39
6043 / ACTIVE FRESH AIR INTAKE — FORCED AIR SYSTEM — SKUTTLE ................................................................. 39
6003 / PASSIVE FRESH AIR INTAKE .......................................................................................................................... 39
6415 / CLOTHES DRYER VENT ................................................................................................................................. 40
4955 / CRAWL SPACE VAPOR BARRIER .................................................................................................................... 40
4957 / CRAWL SPACE — VAPOR BARRIER AND INSULATION .................................................................................. 40
4727 / ROOF VENTILATION — COMBINED SOFFIT AND RIDGE ................................................................................. 40
4981 / INSULATE DOMESTIC WATER SUPPLY PIPE .................................................................................................. 41
5416 / TILE BACKER BOARD — CEMENTITIOUS ......................................................................................................... 41
912 / BASEMENT SLAB INSTALLATION .................................................................................................................... 41
2567 / SIDING — HARDIPLANK .................................................................................................................................. 41
2569 / SIDING — HARDIPLANK WITH RAINSCREEN ................................................................................................. 42
8722 / CARBON MONOXIDE DETECTOR .......................................................................................................................... 42

Energy Auditing and Building Performance Services ........................................................................................................ 42

ENERGY STAR RATING — SUBSTANTIAL REHAB WITH PERFORMANCE PATH ........................................................... 43
ENERGY AUDITING SERVICES ....................................................................................................................................... 43
CONSTRUCTION APPLIANCE ZONE TESTING .................................................................................................................. 43
Introduction

Thank you for your interest in creating a greener future for affordable housing. Enterprise has developed specification recommendations that meet the requirements of both mandatory and optional 2011 Enterprise Green Communities Criteria (The 2011 Criteria can be downloaded at www.greencommunitiesonline.org/tools/criteria/index.asp.). These recommendations were created for single family projects of less than three stories undergoing moderate or substantial rehabilitation, and must be reviewed and adapted to your specific climate, housing stock, local code and zoning, and targeted criteria.

These specifications are intended to be used within a scope of work for soliciting bids from construction contractors, for inclusion as part of a construction contract, and for managing the construction process. We have included specifications for contracting with energy auditors or building performance contractors for energy audits, energy modeling and worst-case combustion appliance zone testing. The specifications for energy auditors and building performance contractors are located at the end of this document.

The ideal integration of Green Single Family Rehabilitation Specifications into a local Housing Program would include:

- Customization of the specifications for your housing stock and housing programs
- Training on the use of these specifications
- Training for contractors as they implement the specifications in your work and/or housing program(s)

CONSIDERATIONS

There are many advantages to specifying a particular brand and model for a component. There are particular brands and model numbers specified in this document. When customizing this document, an investigation into the availability and pricing of that product in the local market should be implemented.

The Unit Costs are included as guidance. One way to obtain local and accurate Unit Pricing is to include contractors in the local investigation by asking for line item breakdowns in their bids. This line item pricing will assist in the calculation of Unit Costs. Other online resources for researching unit costs include Green Building Advisor, as well as BuildingWell.

The specifications are provided in MS Word format so that you can easily edit and reproduce them.

The following position titles are often used as a reference to the staff person that is responsible for a specific housing rehabilitation project: Program Representative, Housing Rehabilitation Specialist, Construction Manager, or Owner. Owner is used as a generic term within this document.
These specifications regularly reference specific products by brand and model number. We suggest including a General Requirements Specification that defines the process for making substitutions.

Here's an example:

**Substitution Approval Process**

Any requests for substitutions of specified proprietary items must accompany the initial proposal and shall include: the manufacturer’s specifications, full installation instructions and warranties. The agency and owner will notify the contractor of decision at contract award.

The Enterprise Green Communities Website has numerous tools and resources available for customization by local public entities or developers. The Enterprise Green Communities Criteria manual also has a complete list of additional resources.
ACRONYMS

AFUE: Annual Fuel Use Efficiency
CAZ: Combustion Appliance Zone
CFCs: Chlorofluorocarbons
CFM: Cubic Feet per Minute
CM: Construction Manager
CO: Carbon Monoxide
DWH: Domestic Water Heater
EER: Energy Efficiency Ratio (an air conditioner's steady-state operating efficiency)
EF: Energy Factor for Water Heaters
EGC: Enterprise Green Communities
GFCI: Ground Fault Circuit Interrupter
GPF: Gallons per Flush
GPM: Gallons per Minute
HCFCs: Hydrochlorofluorocarbons
HSPF: Heating Seasonal Performance Factor (heating efficiency of a heat pump)
IC Rated Fixture: Insulation Contact Rated Fixture
RDC: Remote Desktop Connection
RRP: Renovation, Repair, and Painting Program
SEER: Seasonal Energy Efficiency Ratio (cooling efficiency of a central air conditioner)

Units of Measure
BF: Board Foot (one square foot, one inch thick)
DU: Dobson Unit
EA: Each
GR: General Requirement Specification (unit of measure is not applicable)
LF: Linear Foot
RI: Riser (for staircase)
SF: Square Foot
SY: Square Yard
TN: Tonnage
These specifications are also available as part of the Library of Specification in the Housing Developer Pro® (HDP) software product. HDP automates specification writing and cost estimating. A fully functional 30-day demo of HDP is available at www.CommunityDevelopmentSoftware.com.
General Requirements

7 / GREEN COMMUNITIES INITIATIVE — GENERAL REQUIREMENTS

This project is designed to meet the 2011 Enterprise Green Communities Criteria created by Enterprise Community Partners. The 2011 Criteria may be found at www.greencommunitiesonline.org/tools/criteria/.

The following requirements and other requirements described in specifications must be strictly adhered to:

- All paints and primers must meet the Green Seal G-11 Environmental Standard. www.greenseal.org/certification/standards/paints.cfm
- All caulks and sealants, including floor finishes, must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District www.baaqmd.gov/dst/regulations/rg0851.pdf and may not exceed 250 grams of VOC per liter of coating as thinned to the manufacturer’s maximum recommendation, excluding the volume of any water, exempt compounds, or colorant added to the tint bases.
- All composite wood (particleboard, MDF, etc.) and plywood comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant.

24 / MANUFACTURER’S SPECS

All materials shall be installed in full accordance with the manufacturer’s specifications for working conditions, surface preparation, methods, protection and testing

132 / ACCESSIBILITY — FULLY ACCESSIBLE UNIT / CRITERION 1.2B [OPTIONAL]

The dwelling unit must comply with ICC / ANSI A117.1, Type A, Fully Accessible guidelines. Accessible components include but are not limited to: entry to the unit; doorway clearance throughout the unit; bathroom accessibility; kitchen accessibility; clear floor spaces; thresholds; grab bars; and obstructions.

134 / ACCESSIBILITY — ACCESSIBLE ENTRY / CRITERION 1.2B [OPTIONAL]

The dwelling unit must have an accessible entry per ICC / ANSI A117.1 including but not limited to wheelchair access.

136 / ACCESSIBILITY REQUIREMENTS — COMPONENT REPLACEMENT / CRITERION 1.2B [OPTIONAL]

All components installed that affect accessibility, including but not limited to light switches, electrical receptacles, hand rails, grab bars, stairs, and ramps, must be installed to conform with ICC/ANSI A117.1-2003. The height of the top of new or reinstalled handrails on stairs shall be between 34 and 36 inches measured from the top of the nosing of the stair treads and on ramps between 34 and 36 inches from the surface of the ramp. Handrails shall have a minimum 1.5-inch clearance between the inside of the rail and any wall. All new light switches, electrical receptacles, thermostats, etc., will be placed within reach of occupants with physical challenges per ICC/ANSI A117.1-2003, e.g., a maximum 48 inches above the floor for light switches and a minimum of 15 inches above the floor for electrical receptacles.
138 / ADAPTABILITY — BLOCKING WITH ACCESS TO FRAMING  /  CRITERION 1.2B [OPTIONAL]
When the interior wall finishes of a room are removed to expose the framing blocking will be installed to facilitate the installation of grab bars or hand rails in the future to meet ICC/ANSI A117.1-2003. Examples include blocking in shower stalls, in tub shower units, in alcoves for commodes, and in staircases.

This dwelling unit must have a ventilation system that meets ASHRAE 62.2. See www.ashrae.org/technology/page/548 and www.buildingscience.com/documents/reports/rr-0502-review-of-residential-ventilation-technologies/. (See Ventilation Section of this document.)

9008 / RRP REQUIREMENTS  /  CRITERION 7.15 [MANDATORY]
Any contractor performing renovation, repair, and painting projects that disturb lead-based paint in pre-1978 homes must comply with EPA 40 CFR Part 745 (Lead; Renovation, Repair, and Painting Program), be certified by the EPA as a Renovation Firm, and must use Certified Renovators who are trained by EPA-approved training providers to follow lead-safe work practices.

9003 / LEAD-SPECIFIC LAWS, RULES, REGULATIONS, AND GUIDELINES  /  CRITERION 7.15 [MANDATORY]

9020 / LEAD-BASED PAINT REGULATIONS — FEDERALLY FUNDED HOUSING REHABILITATION  /  CRITERION 7.15 [MANDATORY]
Per HUD Regulation 24 CFR Part 35: The contractor must conform to the lead-based paint requirements for rehabilitation in the appropriate category listed below, based on the amount of rehabilitation assistance provided.

1. When the Federal Rehabilitation Assistance is $1 to $5,000 per unit:
   a. The Contractor shall implement safe work practices during rehabilitation work in accordance with Sec. 35.1350 and repair any paint that is disturbed.
   b. After completion of any rehabilitation disturbing painted surfaces, each work site must pass a clearance examination in accordance with Sec. 35.1340. Neither Clearance nor Lead-Safe Work Practices are required if rehabilitation does not disturb painted surfaces of a total area of more than 20 sq.ft. on exterior, 2 sq.ft. per interior room, or 10% of a small component.

2. When the Federal Rehabilitation Assistance is $5,001 to $25,000 per unit:
   a. The contractor shall perform interim controls, in accordance with Sec. 35.1330, of all identified or presumed lead-based paint hazards.
   b. The contractor shall implement safe work practices during rehabilitation work in accordance with Sec. 35.1350 and repair any paint that is disturbed.
   c. The entire unit shall pass a clearance examination in accordance with Sec. 35.1340.
3. When the Federal Rehabilitation Assistance is more than $25,000 per unit:
   a. The contractor shall abate all identified or presumed lead-based paint hazards in accordance with Sec. 35.1325.
   b. The contractor shall implement safe work practices during rehabilitation work in accordance with Sec. 35.1350 and repair any paint that is disturbed.
   c. The entire unit shall pass a clearance examination in accordance with Sec. 35.1340.

32 / SUBSTITUTION APPROVAL PROCESS
Any requests by the contractor for approval to substitute products specified in the scope of work with another product that performs equally and meets the requirements of the specifications must accompany the contractor’s bid submission. The request must include the following information for the product proposed: the manufacturer’s specifications, full installation instructions, and warranties. The Owner will notify the contractor of decision to approve or deny the substitution at contract award.
Universal Design

**3937 / FIXED SIDE AND REAR WALL GRAB BARS — COMMODE / CRITERION 1.2B [OPTIONAL]**

Install two fixed side wall and one rear wall grab bars, 1.25-inch diameter, type 304, 18-gauge (.049), brushed satin stainless steel, with round snap-on covers and welded 3-inch flanges, and a 1.5-inch space between the bar and wall. Bars must be fastened securely to the wall framing. Install 3.5-inch blocking screwed to wall studs and repair wall finish. The horizontal side wall grab bar shall be 42 inches minimum in length, located 12 inches maximum from the rear wall (behind commode) and extending 54 inches minimum from the rear wall. The vertical side wall grab bar shall be 18 inches minimum in length and shall be mounted with the bottom of the bar located between 39 and 41 inches above the floor, and with the center line of the bar located between 39 and 41 inches from the rear wall. The rear wall grab bar shall be 36 inches minimum in length, and extend from the centerline of the water closet 12 inches minimum on the side closest to the wall, and 24 inches minimum on the transfer side.

*Unit Measure*: EA  /  *Unit Cost*: $475

**3940 / TUB AND SHOWER GRAB BAR SET / CRITERION 1.2B [OPTIONAL]**

Install five grab bars within the tub/shower alcove. Two horizontal grab bars shall be provided on the back wall, one installed in a horizontal position, 33 inches minimum and 36 inches maximum above the floor of the tub measured to the top of the gripping surface and the other 9 inches above the rim of the bathtub. Each grab bar shall be 24 inches minimum in length, located 24 inches maximum from the head end wall and extend to 12 inches maximum from the control end wall. Two grab bars shall be installed on the control end wall. A horizontal grab bar 24 inches minimum in length shall be provided on the control end wall beginning near the front edge of the bathtub and extend toward the inside corner of the bathtub. A vertical grab bar 18 inches minimum in length shall be provided on the control end wall, 3 to 6 inches maximum above the horizontal grab bar, and 4 inches maximum inward from the front edge of the bathtub. One horizontal grab bar 12 inches minimum in length shall be provided on the head end wall at the front edge of the bathtub. All bars shall be 1.25-inch diameter, type 304, 18-gauge (.049), brushed satin stainless steel, with round snap-on covers and welded 3-inch flanges and a 1.5-inch space between the bar and wall. Bars must be fastened securely to the wall framing.

*Unit Measure*: EA  /  *Unit Cost*: $650

**3938 / FOLD-UP GRAB BAR — COMMODE / CRITERION 1.2B [OPTIONAL]**

Install a 1.25-inch diameter 30-inch fold-up grab bar, type 304, 18-gauge (.049), brushed satin stainless steel, an 11-gauge wall plate, and a 600 lb. load rating. The wall plate must be fastened securely to the wall framing. Install blocking screwed to wall studs and repair wall finish. The bar must lock in the folded position. Install the bar so that when in the horizontal position the centerline of the grab bar is 15.75 inches from the centerline of the commode.

*Unit Measure*: EA  /  *Unit Cost*: $450
Site Improvements

427 | TREE — PLANT | CRITERION 3.4 [MANDATORY if providing landscaping]
Contact local underground utility locator prior to planting the tree to identify the location of underground utilities. Do not plant the tree close to underground or overhead utilities. Locate the tree at least 20 feet away from any building. Mark out a planting area four times wider than the root ball diameter. Loosen this area to an 8-inch depth. In the center of the planting area, dig a hole at least twice as wide as the root ball and no deeper than the depth of the soil in the root ball. The bottom of the ball should rest on solid, undisturbed soil. When finished, the soil at the base of the tree must be at the same level on the tree as it was in the container. Plant a 1.5-inch caliper tree listed by the local State Extension Service as native and non-invasive, including staking and 3 inches of mulch except at the trunk, where the soil must be exposed a minimum of 4 inches. See www.extension.umn.edu/distribution/horticulture/DG0466.html for listing of native trees. The insertion of specific trees is highly recommended; examples of specific trees include: caliper Hawthorn or Thornapple (Crataegus spp.), Bitternut Hickory (Carya cordiformis), White Oak (Quercus alba), Black Spruce (Picea mariana), White Spruce (Picea glauca), or Tamarack (Larix laricina).

Unit Measure: EA / Unit Cost: $150

550 | REGRADE FOUNDATION | CRITERION 7.12B [MANDATORY]
Provide and grade a loam topsoil to create at least a 1:4 slope for positive drainage away from house, a minimum 4 feet from the foundation. Reseed the specified area using Fine Fescue seed or a grass seed recommended by the State Extension Service to be noninvasive and drought tolerant. Aerate the specified section using a plug-style aerator administering four passes. Water the area thoroughly to a depth of 6 inches. Just prior to seeding, apply one-half pound of nitrogen per 1,000 square feet in a complete fertilizer. Gently rake the fertilizer into the soil and apply the Fine Fescue seed evenly at a rate of 4.5 lbs. per square foot. See www.csrees.usda.gov/Extension/index.html for a listing of USDA Extension Offices.

Unit Measure: SF / Unit Cost: $0.25

417 | RESEED — FINE FESCUE | CRITERION 3.4 [MANDATORY if providing landscaping]
Reseed the specified area using Fine Fescue seed or a grass seed recommended by the State Extension Service to be noninvasive and drought tolerant. Aerate the specified section using a plug-style aerator, administering four passes. Water the area thoroughly to a depth of 6 inches. Just prior to seeding, apply one-half pound of nitrogen per 1,000 square feet in a complete fertilizer. Gently rake the fertilizer into the soil and apply the Fine Fescue seed evenly at a rate of 4.5 lbs. per square foot. See www.csrees.usda.gov/Extension/index.html for a listing of USDA Extension Offices.

Unit Measure: SF / Unit Cost: $18
Water Conservation

4667 / STORM DRAIN LABELS / CRITERION 3.6 [OPTIONAL]
Label all storm drains or storm inlets within 50 feet of the property to clearly indicate where the drain or inlet leads. Use a simple painted stencil that reads: “Caution: leads to [name of body of water].”

Unit Measure: EA / Unit Cost: $15

7012 / COMMODE — REPLACE WITH 1.28 GPF / CRITERION 4.1 [MANDATORY]
Install a maximum 1.28 GPF white WaterSense® Certified, vitreous china commode tested through the latest edition of the MaP testing project that has been shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush), such as the American Standard FloWise Compact Cadet 3 EL 2568.128. See the following link for the MaP Test Results: www.cuwcc.org/WorkArea/showcontent.aspx?id=14058. Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shutoff valve, and wax seal.

Unit Measure: EA / Unit Cost: $350

7014 / COMMODE — REPLACE WITH DUAL FLUSH / CRITERION 4.1 [MANDATORY]
Install a Dual Flush, two-piece, white commode, with flow rates of 1.6 and 0.9 GPF for its respective high and low flushes, that is WaterSense Certified and tested through the latest edition of the MaP testing project and has been shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush) such as the American Standard EcoFusion EL ADA Model #3380.216. See the following link for the MaP Test Results: www.cuwcc.org/WorkArea/showcontent.aspx?id=14058. Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shutoff valve, and wax seal.

Unit Measure: EA / Unit Cost: $400

7016 / COMMODE — REPLACE WITH 1.2 GPF / CRITERION 4.2 [OPTIONAL; 5 points with other measures]
Install a maximum 1.2 GPF close coupled, white vitreous china commode such as a Kohler Wellworth #K-3531-TR Pressure Lite Elongated, or any 1.2 GPF commode tested through the latest edition of the MaP testing project that has been shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). See the following link for the MaP Test Results: www.cuwcc.org/WorkArea/showcontent.aspx?id=14058. Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shutoff valve, and wax seal.

Unit Measure: EA / Unit Cost: $425

6935 / SHOWER HEAD — 2 GPM / CRITERION 4.1 [MANDATORY]
Install a 2.0 GPM WaterSense Labeled showerhead in chrome such as the Niagara Conservation Earth Massage. Include arm where required.

Unit Measure: EA / Unit Cost: $35
6830 / SINK — SINGLE BOWL COMPLETE / CRITERION 4.1 [MANDATORY]
Install a 22-gauge, 25" x 22" x 7" deep, single bowl, stainless steel, self-rimming kitchen sink, including a steel, metal full port ball-type shutoff valves, and escutcheon plates on all supply and drain lines.

Unit Measure: EA / Unit Cost: $220

6835 / SINK — DOUBLE BOWL COMPLETE / CRITERION 4.1 [MANDATORY]
Install a 22-gauge 33" x 22" x 7" double bowl, stainless steel, self-rimming kitchen sink including a steel, metal body faucet, with a maximum flow rate of 2.0 GPM, and a 15-year drip-free warranty, trap, supply lines, full port ball-type shutoff valves and escutcheon plates on all supply and drain lines.

Unit Measure: EA / Unit Cost: $265

6810 / FAUCET — KITCHEN SINGLE-LEVER 2.0 GPM / CRITERION 4.1 [MANDATORY]
Install a single-lever, washerless, metal-bodied faucet with 15-year drip-free warranty and maximum flow rate of 2.0 GPM.

Unit Measure: EA / Unit Cost: $80

6875 / FAUCET — LAVATORY SINGLE-LEVER 1.5 GPM / CRITERION 4.2 [OPTIONAL; 5 points with other measures]
Install a washerless, single-control, metal-bodied WaterSense Labeled faucet with a 15-year drip-free warranty and a maximum flow rate of 1.5 GPM. Include chromed brass shutoff valves and trap if not existing.

Unit Measure: EA / Unit Cost: $80

7181 / BATH — 3-FIXTURE COMPLETE — GCI / CRITERIA 4.1 AND 7.9C [MANDATORY]
Re-plumb entire bath to provide fixtures as follows:

1. Install a 5-foot, 4-piece, Sterling Advantage™ fiberglass tub and shower unit 60"x 30" x 72". Product #61030126 (right-hand drain) or #61030116 (left-hand drain). Include age-in-place factory-installed backers for later grab bar installation (www.sterlingplumbing.com/home.shtml), complete with lever-operated pop-up drain and overflow, PVC waste, single-lever shower diverter, shower rod, Delta Monitor Model 1343 tub/shower faucet (www.deltafaucet.com), and a WaterSense Labeled shower head with a maximum 2.0 GPM flow rate. Install faucet controls toward the outside of the tub for easier access. Exterior wall sections behind the tub/shower unit and any plumbing penetrations must be completely air-sealed prior to installation. Per installation instructions, set basin area in 1 to 2 inches of mortar cement.

2. Install a 1.28 GPF white American Standard FloWise Compact Cadet 3 EL 2568.128. Commode must be ADA height and WaterSense Labeled, and tested through the latest edition of the MaP testing project that has shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). See the following link for the MaP Test Results: www.cuwcc.org/MaPTesting.aspx. Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shutoff valve, and wax seal.
3. Install a 24-inch plywood vanity, including top with backsplash, wash bowl, and single-lever brass-bodied WaterSense Labeled chrome faucet with a maximum 1.5 GPM flow rate. Include PVC drain attached to a code legal plumbing vent; use type L copper or PEX supply piping with brass-bodied stops on all supply lines. Seal all penetration through the floor, walls, and cabinet for plumbing connections using expanding foam or caulk and cover with chrome escutcheon plates. Cabinets must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant.

Unit Measure: EA / Unit Cost: $4,340

7183 / BATH FIXTURES — ADVANCED WATER SAVING / CRITERION 4.2 [OPTIONAL; 5 points with other measures]
Install a maximum 1.2 GPF close coupled, white, vitreous china commode such as a Kohler Wellworth #K-3531-TR Pressure Lite Elongated, or any 1.2 GPF or better commode tested through the latest MaP testing that has shown to score 800 or better on the MaP Flush Performance test (grams of solid waste removed in a single flush). See the following link for the MaP report: www.allianceforwaterefficiency.org/MaP-main.aspx. Include a manufacturer's approved plastic or pressed wood white seat, supply pipe, shutoff valve, and wax seal; a 1.5 GPM showerhead; and a 0.5 GPM bath vanity faucet.

Unit Measure: EA / Unit Cost: $575

6958 / BATHTUB/SHOWER — 5-FOOT FIBERGLASS — COMPLETE, ADAPTABLE / CRITERIA 4.1 AND 7.9C [MANDATORY]
Install a 5-foot, 4-piece, Sterling Advantage fiberglass tub and shower unit 60" x 30" x 72": Product #61030126 (right-hand drain) or #61030116 (left-hand drain). Including age-in-place factory-installed backers for later grab bar installation (www.sterlingplumbing.com/home.strl) complete with lever-operated pop-up drain and overflow, PVC waste, single-lever shower diverter, shower rod, Delta Monitor Model #1343 tub/shower faucet (www.deltafaucet.com/), and a WaterSense Labeled shower head with a maximum 2.0 GPM flow rate. Install faucet controls toward the outside of the tub for easier access. Exterior wall sections behind the tub/shower unit and any plumbing penetrations must be completely air-sealed prior to installation. Per installation instructions, set basin area in 1 to 2 inches of mortar cement.

Unit Measure: EA / Unit Cost: $900

6960 / BATHTUB/SHOWER — 5-FOOT FIBERGLASS — COMPLETE WITH GRAB BARS / CRITERIA 4.1 AND 7.9C [MANDATORY]; CRITERION 1.2B [OPTIONAL]
Install a 5-foot, 4-piece, Sterling Accord™ fiberglass tub and shower unit 60" x 30" x 72": Product #71240125 (right-hand drain) or #71240115 (left-hand drain). Include a seat and ADA compliant grab bars (www.sterlingplumbing.com/home.strl), complete with lever-operated pop-up drain and overflow, PVC waste, single-lever shower diverter, shower rod, Delta Monitor Model 1343 tub/shower faucet (www.deltafaucet.com/), and a WaterSense Labeled shower head with a maximum 2.0 GPM flow rate. Install faucet controls toward the outside of the tub for easier access. Exterior wall sections behind the tub/shower unit and any plumbing penetrations must be completely air-sealed prior to installation. Per installation instructions, set basin area in 1 to 2 inches of mortar cement.

Unit Measure: EA / Unit Cost: $1,950
8491 / DISHWASHER — TWO-CYCLE / CRITERION 5.4 [MANDATORY if providing appliances]
Provide and install a 24-inch white, two-cycle, built-in ENERGY STAR qualified dishwasher, including all alterations and connections to plumbing and electric system. Whirlpool Model #DU811SWPU or GE Model #GSD1300NWW.
Unit Measure: EA / Unit Cost: $300

8510 / ENERGY START ASHER-DRYER — STACKED / CRITERION 5.4 [MANDATORY if providing appliances]
Install a matched pair ENERGY STAR qualified washer such as the GE #WBVH6240HWW and a 240-volt electric dryer such as the GE #DCVH640EJWW as a stackable combo in white enameled steel using the manufacturer’s brackets to connect the washer and dryer and level the assembly in its final position. Use braided steel water supply lines and a smooth rubber drain line connected to a 2-inch drain with trap. The dryer will be vented directly to the outside using galvanized 4-inch duct with all seams sealed with duct mastic, and securely fastened to framing. Do not use plastic dryer duct. A maximum 2-foot length of flexible metal duct is permissible between the dryer and the galvanized duct.
Unit Measure: EA / Unit Cost: $1,600
Energy Efficiency

4903    AIR-SEAL BUILDING ENVELOPE    CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
Seal all accessible cracks, gaps, and holes in the building envelope with low-VOC caulk (if less than 0.25 inches) or expanding foam (if greater than 0.25 inches). Large holes shall be sealed with board stock, such as particle board, plywood, extruded polystyrene, or foil-faced polyisocyanurate foam sheathing, carefully cut to fit the opening, solidly attached to surrounding framing and sealed with foam or caulk sealant. Seal all top plate and bottom plate penetrations. If the foundation masonry wall is open-core concrete block, seal the tops of the block with expanding foam. Seal all penetrations created by plumbing, gas lines, electrical boxes, and outlets. Seal accessible gaps between the structure and window and door units with low expansive foam. Take care to seal all joints without excess sealant. Seal any gaps in the building envelope adjacent to flues with carefully cut to fit sheet metal collars that are securely fastened to framing, sealing all seams and gaps with fire-rated caulk. Remove any recessed light fixtures in insulated ceilings and seal the resulting openings. Seal any entries to attic space using weather stripping on attic doors or hatches. Air-sealing must be done prior to the installation of insulation.

Note: We recommend the addition of a performance measure for the completed air sealing work such as a maximum CFM of air leakage per square foot of building envelope at 50 Pascal pressure differential between outdoors and the conditioned space measured by a blower door.

Unit Measure: SF (of floor area per level) / Unit Cost: $0.60

7744    REPLACE RECESSED LIGHT FIXTURE    CRITERIA 5.1 (A,B,C,D) [MANDATORY]; OR 5.2 [OPTIONAL] AND 5.5A [MANDATORY]
Carefully remove existing recessed light fixture, minimizing damage to the finished ceiling. Install a ceiling electrical box and connect the existing conductors. Install a drywall or plaster patch to create a flush and airtight patch in the opening. Install an ENERGY STAR qualified, flush-mounted ceiling light fixture using a GU24 Base lamp such as the Efficient Lighting Model #EL-815-123-W. Connect to existing wiring. Finished product shall be airtight and hide any patching.

Unit Measure: EA / Unit Cost: $155

4904    AIR-SEAL — ISOLATE GARAGE    CRITERIA 5.1 (A,B,C,D); OR 5.2 [OPTIONAL] AND 7.13 [MANDATORY]
Seal all accessible cracks, gaps, and holes in the building envelope between the conditioned space and the attached garage with low-VOC caulk (if less than 0.25 inches) or expanding foam (if greater than 0.25 inches). Large holes shall be sealed with board stock, such as particle board, plywood, extruded polystyrene, or foil-faced polyisocyanurate foam sheathing, carefully cut to fit the opening, solidly attached to surrounding framing, and sealed with foam or caulk sealant. Seal all wall penetrations created by plumbing, gas lines, electrical boxes, and outlets. Take care to seal all joints without excess sealant. Ensure an air-seal between the conditioned space and the attached garage at all drywall surfaces. Weatherstrip the entrance door to the house.

Unit Measure: SF / Unit Cost: $0.50
After cleaning the area thoroughly, apply expanding spray foam to the rim joist at the entire perimeter of the basement and/or the exterior walls of conditioned crawl spaces. Install to R-19 at a minimum. Use a spray foam product that meets Underwriters Laboratories, Inc. classification Certificate R7813 such as Dow FROTH-PAK FS Foam or Handi-Foam Two Component E-84 Class A Foam. Insulate from the subfloor for the first floor to the top of the foundation wall, and seal all penetrations and the top of the foundation. Seal all openings within the area of the rim joist created by plumbing, gas lines, electrical boxes or any other penetrations.

Unit Measure: LF / Unit Cost: $2.50

After air-sealing (Spec #16-4903), carefully install at least 3 inches of Dow Thermax board along the entire perimeter of the exterior of the building directly in contact with the rim joist. Cut and carefully friction-fit the boards between joists that are perpendicular to the rim joist. Fasten the foam board to straight runs of rim joist with construction-grade low-VOC adhesive and tack in place with mechanical fasteners. Lap the seams of each layer of rigid foam board and seal all seams with Thermax aluminum foil or white foil tape. Seal the edges of the foam boards to all adjoining flooring, joists, masonry, and sill plates with low-VOC caulk. Carefully trim and fit foam boards around penetrations through the rim joist and seal with low-VOC caulk.

Unit Measure: LF / Unit Cost: $2.00

After air-sealing (Spec #16-4903), install 3.5-inch thick, R-13, kraft paper-faced fiberglass roll insulation between studs per manufacturer’s specifications, carefully fit around all mechanical and structural components so that there are no gaps, the batt is not compressed, and the cavities are completely filled. Staple flanges to the faces of the studs. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality, pulling some of the facing away from the studs. The contractor will reinstall areas accessed for inspection. Insulation must be inspected before the wall finish is installed.

Unit Measure: SF / Unit Cost: $0.75

After air-sealing (Spec #16-4903), install 3.5-inch thick, R-13, unfaced fiberglass roll insulation between studs per manufacturer’s specifications, carefully fit around all mechanical and structural components so that there are no gaps, the batt is not compressed, and the cavities are completely filled. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality. The contractor will reinstall areas accessed for inspection. Insulation must be inspected before the wall finish is installed.

Unit Measure: SF / Unit Cost: $0.65
4910 / INSULATE WALL — R-19 KRAFT FACED BATT / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), install R-19, kraft paper-faced fiberglass roll insulation between studs per manufacturer’s specifications, carefully fit around all mechanical and structural components so that there are no gaps, the batt is not compressed, and the cavities are completely filled. Staple flanges to the faces of the studs. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality, pulling some of the facing away from the studs. The contractor will reinstall areas accessed for inspection. Insulation must be inspected before the wall finish is installed.

Unit Measure: SF / Unit Cost: $1.05

4911 / INSULATE WALL — R-19 UNFACED BATT / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), install R-19, unfaced fiberglass roll insulation between studs per manufacturer’s specifications, carefully fit around all mechanical and structural components so that there are no gaps, the batt is not compressed, and the cavities are completely filled. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality. The contractor will reinstall areas accessed for inspection. Insulation must be inspected before the wall finish is installed.

Unit Measure: SF / Unit Cost: $0.95

4908 / WALL INSULATION — DENSE PACK CELLULOSE / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), drill 2.125-inch to 2.5625-inch access holes for each stud cavity in the areas specified in interior or exterior locations approved by the Owner. Install blown-in, borate treated (no ammonium sulfate permitted), cellulose insulation per manufacturer’s specifications and dense-packed into all specified wall cavities to a minimum density of 3.5 lbs. per cubic foot for the entire cavity. Use a 1- to 1.25-inch ID vinyl wall tube attached to the standard cellulose blower tubing to place the cellulose deep into the wall cavity. Check each stud cavity for blocking and other obstructions prior to blowing. Carefully seal all drilled holes with wood or foam plugs and patch all holes to match surrounding materials if the surface is exposed. In balloon-framed houses, ensure that blown cellulose is blocked from entering floor cavities such as second-floor floors. See www.karg.com/pdf/Presentations/Dense_Pack_Cellulose_Insulation.pdf for additional information.

Unit Measure: SF / Unit Cost: $0.85

4922 / WALL INSULATION — DENSE PACK FIBERGLASS / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), check each stud cavity for blocking and other obstructions. Drill access holes for each stud cavity in the areas specified in interior or exterior locations approved by the Owner. Install blown-in, formaldehyde-free fiberglass insulation, dense-packed into all specified wall cavities to a minimum density of 2.6 lbs. per cubic foot for the entire cavity to attain a minimum R-value of 15. Use a minimum 10-foot-long, 1- to 1.25-inch ID vinyl wall tube to fill the wall cavities completely, fishing the tube from a hole in the bottom of the cavity to the top of the cavity to start. Drill additional holes as necessary to fill all portions of the specified walls. Carefully seal all drilled holes with wood or foam plugs and patch all holes to match surrounding materials if the surface is exposed. In balloon-framed houses, ensure that blown fiberglass is blocked from entering floor cavities such as second-floor floors.

Unit Measure: SF / Unit Cost: $1.20
4909 / WALL INSULATION — DAMP SPRAY CELLULOSE 2 X 4 WALL / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After all mechanical systems have been installed and after air-sealing (Spec #16-4903), install a damp-spray cellulose product at a density of 3.25 lbs. per cubic foot that is borate-treated (no ammonium sulfate permitted). Protect electrical boxes, ductwork outlets, and other components in the wall whose performance would be compromised by the application of the cellulose. The installation shall completely fill the specified cavities of the building envelope without voids. Scrub excess cellulose off of the face of the interior side of the framing so that the surface of the installed cellulose is flush with the framing, and so that the finished wall surface may be installed directly on the face of the framing without obstruction. The worksite shall be cleaned to remove overspray and scrubbed cellulose. The installation shall be allowed to cure to the manufacturer’s requirements prior to the installation of a wall finish.

Unit Measure: SF / Unit Cost: $0.80

4918 / INSULATE CEILING, R-30 UNFACED BATT / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), install R-30 unfaced fiberglass batts between the ceiling joists, carefully fitting the fiberglass around obstructions such as wires, pipes ductwork, and building components to ensure a consistent and continuous R-30 rating. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality. The contractor will reinstall areas accessed for inspection.

Unit Measure: SF / Unit Cost: $1.25

4920 / INSULATE CEILING, R-30 KRAFT FACED BATT / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), install R-30 unfaced fiberglass batts between the ceiling joists, carefully fitting the fiberglass around obstructions such as wires, pipes ductwork, and building components to ensure a consistent and continuous R-30 rating. Staple flanges to the interior faces of the studs. Notify Owner when the installation is ready for inspection. The inspection will include spot checks for quality, pulling some of the facing away from the studs. The contractor will reinstall areas accessed for inspection. Insulation must be inspected before the ceiling finish is installed.

Unit Measure: SF / Unit Cost: $1.35

4938 / ATTIC INSULATION — CELLULOSE — DENSE PACK / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]
After air-sealing (Spec #16-4903), install blown-in, borate-treated (no ammonium sulfate permitted) cellulose insulation dense-packed into closed floor cavities to a minimum density of 3.5 lbs. per ft. Maintain ventilation routes from soffit and other vents with baffles. Replace all material removed or cut to gain access to match existing materials.

Note: If access to attic is via a fixed staircase, insulate stairs to attic, landing, and interior stairwell walls as part of this item. If access is via a hatch insulate the hatch, with 3 inches of reflective foil-faced polyisocyanurate foam and seal edges with compatible foil tape. If access is via a fold-down stair, insulate the stair with an airtight, 2-inch-thick reflective foil-faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.

Unit Measure: SF / Unit Cost: $0.95
**4935 / ATTIC R-30 CELLULOSE / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]**

After air-sealing (Spec #16-4903), install blow-in borate-treated (no ammonium sulfate permitted), cellulose insulation per manufacturer’s specifications to R-30. Maintain ventilation routes from soffit and other vents with baffles. Replace all material removed or cut to gain access to match existing materials.

**Note:** If access to attic is via a fixed staircase, insulate stairs to attic, landing, and interior stairwell walls as part of this item, dense-packing the cellulose into closed floor, stair, and wall cavities to a minimum density of 3.5 lbs. per cubic foot. If access is via a hatch, insulate the hatch with 3 inches of reflective foil-faced polyisocyanurate foam and seal edges with compatible foil tape. If access is via a fold-down stair, insulate the stair, with an airtight 2-inch-thick reflective foil-faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.

*Unit Measure: SF / Unit Cost: $0.75*

**4937 / ATTIC R-45 CELLULOSE / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]**

After air-sealing (Spec #16-4903), blow-in borate-treated (no ammonium sulfate permitted), cellulose insulation per manufacturer’s specifications to R-45. Maintain ventilation routes from soffit and other vents with baffles. Replace all material removed or cut to gain access to match existing materials.

**Note:** If access to attic is via a fixed staircase, insulate, stairs to attic, landing and interior stairwell walls as part of this item, dense-packing the cellulose into closed floor, stair, and wall cavities to a minimum density of 3.5 lbs. per cubic foot. If access is via a hatch, insulate the hatch with 3 inches of reflective foil-faced polyisocyanurate foam and seal edges with compatible foil tape. If access is via a fold-down stair, insulate the stair, with an airtight 2-inch-thick reflective foil-faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.

*Unit Measure: SF / Unit Cost: $0.95*

**4912 / INSULATE WALL, CEILING, FLOOR CAVITY — CLOSED CELL FOAM / CRITERIA 5.1 (A,B,C,D) [MANDATORY] OR 5.2 [OPTIONAL]**

Install closed cell polyurethane spray foam with a minimum fully aged R-value per inch of R-6 into the specified building envelope cavity to the thickness specified. Moisture content of all components of the cavity must be less than 11% at the time of the application of the foam. The contractor must supply the Owner with the ASTM E84 test results or the ICC-ES ES Report (www.icc-es.org) for the foam product being installed in advance of the installation so that the approved maximum thickness of each pass and total approved thickness is understood in advance of the installation.

*Unit Measure: BF (1 sq.ft. at 1 inch thickness) / Unit Cost: $1.05*
Electrical

8137 / UPDATE EXISTING ELECTRIC — BATHROOM / CRITERION 5.5A [MANDATORY]
Update the electrical fixtures in the bathroom, including:

1. One 20A GFCI receptacle located near sink with a 20 AMP circuit installed no more than 45 inches from the floor.

2. An ENERGY STAR qualified ceiling mounted Fan/Light fixture, with a 6-inch duct outlet such as the Broan Model #QTXE080FLT capable of minimum 80 CFM operating at 1 sone or less, with an integral damper, and vented to the exterior. The fixture must accommodate two GU24 fluorescent lamps. Switch fan and light using a single switch with a time delay for the fan such as the EFI Fan/Light Time Delay Switch part #5100.505 (in Ivory) www.energyfederation.org/consumer/default.php/cPath/39_766_134 or equipped with a humidistat sensor. Install galvanized metal duct the same diameter as the fan outlet and vent to the exterior, ideally through a wall or gable end using a metal hooded vent of like diameter and with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling installation and air seal fan/light assembly to the ceiling with low-VOC caulk and air seal fan/light assembly to the ceiling with low-VOC caulk.

3. One ENERGY STAR qualified wall mounted chrome or nickel finish vanity light fixture using three 13-watt GU24 base bulbs such as the Portfolio Model #26534 or the Efficient Lighting three-lamp fixture model #EL-210-03-318 installed above the sink.

Unit Measure: RI / Unit Cost: $425

7819 / ENERGY STAR FAN / LIGHT FIXTURE / CRITERIA 7.4A [MANDATORY for substantial rehab] OR 7.4B [OPTIONAL for moderate rehab]
Install an ENERGY STAR qualified ceiling mounted fan/light fixture, with a 6-inch duct outlet such as the Broan Model #QTXE080FLT capable of minimum 80 CFM operating at 1 sone or less, with an integral damper, and vented to the exterior. The fixture must accommodate two GU24 fluorescent lamps. Switch fan and light using a single switch with a time delay for the fan such as the EFI Fan/Light Time Delay Switch part #5100.505 (in Ivory) www.energyfederation.org/consumer/default.php/cPath/39_766_134 or equipped with a humidistat sensor. Install galvanized metal duct the same diameter as the fan outlet, and vent to the exterior, ideally through a wall or gable end using a metal hooded vent of like diameter and with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling and air seal fan/light assembly to the ceiling with low-VOC caulk.

Unit Measure: EA / Unit Cost: $225

7752 / ENERGY STAR INTERIOR CEILING FIXTURE / CRITERION 5.5A [MANDATORY]
Install an ENERGY STAR qualified, flush-mounted ceiling light fixture using a GU24 Base lamp such as the Efficient Lighting model #EL-815-123-W.

Unit Measure: EA / Unit Cost: $65

7753 / ENERGY STAR INTERIOR WALL FIXTURE / CRITERION 5.5A [MANDATORY]
Install an ENERGY STAR qualified light fixture using a GU24 base lamp wall fixture such as the Progress Lighting Model #P2896-15EBW

Unit Measure: EA / Unit Cost: $75
7761 / ENERGY STAR 2-BULB BATH VANITY FIXTURE / CRITERION 5.5A [MANDATORY]
Install an ENERGY STAR qualified over-vanity light fixture using GU24 base lamps such as Efficient Lighting Model #EL-205G-223 installed above the sink.

Unit Measure: EA / Unit Cost: $85

7763 / ENERGY STAR 3-BULB BATH VANITY FIXTURE / CRITERION 5.5A [MANDATORY]
Install an ENERGY STAR qualified wall-mounted chrome or nickel finish vanity light fixture using three 13-watt GU24 base bulbs such as the Portfolio Model #26534 or the Efficient Lighting three-lamp fixture model #EL-210-03-318 installed above the sink.

Unit Measure: EA / Unit Cost: $145

7751 / ENERGY STAR KITCHEN CEILING FIXTURE / CRITERION 5.5A [MANDATORY]
Install an ENERGY STAR qualified, four 4-foot tube instant-start fluorescent ceiling light fixture, with an acrylic diffuser, such as the American Fluorescent Item #184346 or Model #PLW432RC.

Unit Measure: EA / Unit Cost: $195

8166 / REPLACE EXTERIOR LIGHT FIXTURE / CRITERION 5.5A [MANDATORY]; OR 5.2 [OPTIONAL] AND 5.5A [MANDATORY]
Install an ENERGY STAR qualified two-lamp halogen, dusk to dawn light fixture with motion-activated higher light level function, such as a Heath Zenith Twin 150-Watt Quartz, Item #182159, Model #SL-5512-BZA. Set the delay on the motion-detected brighter setting to five minutes.

Unit Measure: EA / Unit Cost: $80

7744 / REPLACE RECESSED LIGHT FIXTURE / CRITERIA 5.1 (A,B,C,D) [MANDATORY]; OR 5.2 [OPTIONAL] AND 5.5A [MANDATORY]
Carefully remove existing recessed light fixture, minimizing damage to the finished ceiling. Install a ceiling electrical box and connect the existing conductors. Install a drywall or plaster patch to create a flush and airtight patch in the opening. Install an ENERGY STAR qualified, flush-mounted ceiling light fixture using a GU24 base lamp such as the Efficient Lighting Model #EL-815-123-W. Connect to existing wiring. Finished product shall be airtight and hide any patching.

Unit Measure: EA / Unit Cost: $155

7757 / CFL REPLACEMENT LAMP / CRITERION 5.5A [MANDATORY]
Install a 9-watt CFL medium screw base lamp in the specified light fixture properly disposing of any existing lamp.

Unit Measure: EA / Unit Cost: $7.00
HVAC

6041 / REPLACE FURNACE 90+ GAS / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing furnace, recycle all metal components and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
  - Use the most recent version of the ACCA’s Manual J residential load calculation tool www.acca.org/store/product.php?pid=172 (calculate the load with Manual J based on the post rehab building envelope), and use the most recent version of ACCA’s Manual S for equipment selection.
- Install a 90+ gas-fired forced-air furnace with minimum AFUE rating of 90% on 2 inches patio block to existing ductwork and gas line. New furnace will have minimum limited warranties of: 20 years on heat exchangers, five years on parts. New furnace will be vented with PVC piping per manufacturer’s specifications.
- Install a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature, and a lighted digital display such as the Lux Model Psp511LC, vent pipe, and new shut-off valve.
- Rework cold air return if necessary to ensure easy access, good fit, easy replacement of air filter, and proper air flow.
- An exterior return air filter box or boxes shall be installed to filter all return air to the new furnace.
- All exposed duct seams will be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Remove all existing cloth duct tape prior to installing mastic.

Unit Measure: EA / Unit Cost: $3,100

6175 / HEAT PUMP — REPLACE — 16 SEER / CRITERIA 5.1 (A,B,C,D), 5.3 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing furnace, recycle all metal components, and dispose of all other materials in a code legal dump. Remove existing heat pump after capturing all CFC and HCFCs, recycle all metal components, and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
  - Use the most recent version of the ACCA’s Manual J residential load calculation tool www.acca.org/store/product.php?pid=172 (calculate the load with Manual J based on the post rehab building envelope), and use the most recent version of ACCA’s Manual S for equipment selection.
- Install a 16 SEER (12.5 EER and 8.5 HSPF) heat pump to existing ductwork and gas line. Heat pump will have minimum limited warranties of five years on parts.
- Install an outdoor thermostat set to the balance point of the house to prevent supplementary heater operation when the heat pump is capable of meeting the heating load. New outdoor heat pump will be installed on a code-approved outdoor pad or lintels and be set on 6-inch pump-up legs.
- Install a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature, and a lighted digital display, such as the Lux Model #Psp511LC.
- Ensure that the system ductwork is capable of handling 400 ft³ per minute per ton of airflow.
- Rework cold air return if necessary to ensure easy access, good fit, and easy replacement of air filter.
- All exposed duct seams will be sealed with a low-VOC spreadable mastic such as RDC Corp. #7, #8, or #9. Remove all existing cloth duct tape prior to installing mastic.

Unit Measure: EA / Unit Cost: $6,000
6176 / REPLACE HEAT PUMP — 13 SEER / CRITERIA 5.1 (A,B,C,D), 5.3 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing Heat Pump after capturing all CFC and HCFCs, recycle all metal components and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
- Install a 13 SEER heat pump to existing ductwork and gas line. Heat pump will have minimum limited warranties of five years on parts.
- Install an outdoor thermostat set to the balance point of the house to prevent supplementary heater operation when the heat pump is capable of meeting the heating load. New outdoor heat pump will be installed on a code-approved outdoor pad or lintels and be set on 6 inch pump-up legs.
- Install a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature and a lighted digital display such as the Lux Model PspS11LC.
- Ensure that the system ductwork is capable of handling 400 ft³ per minute per ton of airflow.
- Rework cold air return if necessary to ensure easy access, good fit and easy replacement of air filter.
- All exposed duct seams will be sealed with a low-VOC spreadable mastic such as RDC Corp. #7, #8, or #9. (Remove all existing cloth duct tape prior to installing mastic.)

*Unit Measure: EA / Unit Cost: $7,500*

6337 / DUCT SEALING / CRITERIA 5.1 (A,B,C,D) [MANDATORY] AND 5.2 [OPTIONAL]

Seal joints, collars, flex duct connections, and seams in ductwork and plenums with a low-VOC, spreadable mastic such as RCD Corporation’s RDC Corp. #7, #8, or #9. Apply a minimum 30-mil thickness. Include a bedded application of fiberglass mesh over holes or open cracks. Do not use tape.

*Unit Measure: LF / Unit Cost: $4*

6339 / RETURN AIR TRANSFER GRILL (12" X 6") / CRITERION 5.3 [MANDATORY]

Install a Tamarack Return Air Pathway (RAP) 12.6 (12" x 6") sound and light-restricted bypass grill to air balance forced air system [www.tamtech.com](http://www.tamtech.com). Install in stud cavity between specified room and common space to provide return air. Seal to wall finish and install flange trim.

*Unit Measure: EA / Unit Cost: $75*

6340 / RETURN AIR TRANSFER GRILL (12" X 12") / CRITERION 5.3 [MANDATORY]

Install a RAP 12.12 (12" x 12") sound and light-restricted bypass grill to air balance forced air system [www.tamtech.com](http://www.tamtech.com). Install in stud cavity between specified room and common space to provide return air. Seal to wall finish and install flange trim.

*Unit Measure: EA / Unit Cost: $85*
6244 / BOILER — HIGH EFFICIENCY — GAS REPLACE / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing boiler, recycle all metal components, and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
  - Use the most recent version of the ACCA’s Manual J residential load calculation tool
    www.acca.org/store/product.php?pid=172 (calculate the load with Manual J based on the post-rehab building envelope), and use the most recent version of ACCA’s Manual S for equipment selection.
- Replace existing boiler with a minimum 95 AFUE rated, gas-fired, modulating, direct vent, water boiler such as the Utica UB95M-200 boiler.
- Install boiler, connected to the distribution piping and baseboard convectors that service the entire house. Installation to include all power and control wiring, a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature, and a lighted digital display, such as the Lux Model Psp511LC, expansion tank, one circulation pump, water and gas supply, and flue piping.
- The installation is required to maintain a minimum 70°F indoor temperature when outdoor temperature is -10°F.

Unit Measure: EA / Unit Cost: $7,300

6246 / BOILER — HIGH EFFICIENCY — GAS REPLACE COMPLETE / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing boiler, recycle all metal components and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
  - Use the most recent version of the ACCA’s Manual J residential load calculation tool
    www.acca.org/store/product.php?pid=172 (calculate the load with Manual J based on the post-rehab building envelope), and use the most recent version of ACCA’s Manual S for equipment selection.
- Replace existing boiler and distribution system with a minimum 95 AFUE rated gas-fired, modulating, direct vent, water boiler such as the Utica UB95M-200. Include distribution piping and baseboard convectors to service entire house.
- Installation to include all power and control wiring, a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature, and a lighted digital display such as the Lux Model Psp511LC, expansion tank, one circulation pump, water and gas supply, and flue piping.
- The installation is required to maintain a minimum 70°F indoor temperature evenly throughout the conditioned space when outdoor temperature is -10°F.

Unit Measure: EA / Unit Cost: $5,600

6247 / BOILER — HIGH EFFICIENCY — WITH INDIRECT WATER HEATER / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]

- Remove existing boiler and water heater, recycle all metal components, and dispose of all other materials in a code legal dump.
- Provide both Manual J and S reports to the Owner for review and approval prior to installation.
  - Use the most recent version of the ACCA’s Manual J residential load calculation tool
    www.acca.org/store/product.php?pid=172 (calculate the load with Manual J based on the post-rehab building envelope), and use the most recent version of ACCA’s Manual S for equipment selection.
• Replace existing boiler with a minimum 93 AFUE rated gas-fired, modulating, direct vent, water boiler. Install boiler, connected to the distribution piping and baseboard convector that service the entire house.

• Installation to include all power and control wiring, a setback thermostat with separate weekday and weekend programs, four settings per day, a vacation hold feature, and a lighted digital display such as the Lux Model #Psp511LC, expansion tank, one circulation pump, water and gas supply, and flue piping.

• The installation is required to maintain a minimum 70°F indoor temperature when outdoor temperature is –10°F. Install an indirect-fired 40-gallon water tank as a separate zone on the boiler with a maximum heat loss rating of 1° per hour.

Unit Measure: EA  /  Unit Cost: $9,800

Domestic Hot Water

7077 / WATER HEATER — 40-GALLON GAS — POWER VENTED / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]
Install a 40-gallon, glass-lined, minimum 0.67 energy factor (EF), power-vented, insulated to minimum R-16, gas-fired water heater with a 6-year warranty. Include pressure and temperature relief valve, discharge tube to within 6 inches of floor, condensate pump, Owner’s Manual, and all ductwork to power vent to exterior. Provide separate electrical circuit and new gas piping from shutoff valve to fixture. If the water heater is located in a basement with a floor drain, the discharge tube shall be directed to the drain. If it is located on an upper floor or if there is no floor drain, install a catch pan drained to the exterior. Recycle the existing water heater.

Unit Measure: EA  /  Unit Cost: $1,050

7079 / WATER HEATER — 50-GALLON GAS — POWER VENTED / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]
Install a 50-gallon, glass-lined, minimum 0.67 EF, power-vented, insulated to minimum R-16, gas-fired water heater with a 6-year warranty. Include pressure and temperature relief valve, discharge tube to within 6 inches of floor, condensate pump, Owner’s Manual, and all ductwork to power vent to exterior. Provide separate electrical circuit and new gas piping from shutoff valve to fixture. If the water heater is located in a basement with a floor drain, the discharge tube shall be directed to the drain. If it is located on an upper floor or if there is no floor drain, install a catch pan drained to the exterior. Recycle the existing water heater.

Unit Measure: EA  /  Unit Cost: $1,150

7081 / WATER HEATER — 50-GALLON GAS (95+) — POWER VENTED / CRITERIA 5.1 (A,B,C,D), 5.3, 7.8 [MANDATORY] AND 5.2 [OPTIONAL]
Install a 50-gallon, glass lined, minimum 95% efficient, condensing, power-vented, gas-fired water heater with a 6-year warranty. Include pressure and temperature relief valve, discharge tube to within 6 inches of floor, condensate pump, Owner’s Manual, and all ductwork to power vent to exterior. Provide separate electrical circuit and new gas piping from shutoff valve to fixture. If the water heater is located in a basement with a floor drain, the discharge tube shall be directed to the drain. If it is located on an upper floor or if there is no floor drain, install a catch pan drained to the exterior. Recycle the existing water heater.

Unit Measure: EA  /  Unit Cost: $2,050
Install a 50-gallon capacity ENERGY STAR qualified heat pump electric water heater with an EF rating of at least 2.35, and a replaceable anode rod such as the GE GeoSpring Hybrid GE H50DNSRSA. Include pressure and temperature relief valve, discharge tube to within 6 inches of floor, Owner’s Manual, and all piping. Recycle the existing water heater.

Unit Measure: EA  /  Unit Cost: $1,750

Replace existing water heater with a gas-fired, closed-combustion, tankless water heater with a minimum 7 GPM flow rate. Include pressure and temperature relief valve, discharge tube to within 6 inches of floor, Owner’s Manual, and all venting piping. Provide separate electrical circuit, and gas inlet and water inlet, and outlet shut-off valves. If the water heater is located in a basement with a floor drain, the discharge tube shall be directed to the drain. If it is located on an upper floor or if there is no floor drain, install a catch pan drained to the exterior. Recycle the existing water heater.

Unit Measure: EA  /  Unit Cost: $1,850
Materials Beneficial to the Environment

Waste Stream

739 / REUSE BUILDING COMPONENT / CRITERIA 6.3 [MANDATORY] AND 6.4 [OPTIONAL]
Using lead-safe work practices, carefully contain and protect the specified building component and all of its related parts and hardware for reuse. Repair as specified.

Unit Measure: EA / Unit Cost: $100

741 / SALVAGE BUILDING COMPONENT FOR RECYCLING / CRITERIA 6.3 [MANDATORY] AND 6.4 [OPTIONAL]
Using lead-safe work practices, remove specified building component and all of the related parts and hardware for recycling. Deliver to specified recycling or building component reuse center. Provide receipt with details of the delivery.

Unit Measure: EA / Unit Cost: $75

798 / DISPOSAL — RECYCLE CONSTRUCTION WASTE / CRITERIA 6.3 [MANDATORY] AND 6.4 [OPTIONAL]
Using lead-safe work practices, contract with a waste disposal company that recycles construction waste either by providing separate dumpsters for specific materials to be recycled, or by sorting waste off-site. Provide receipts with documentation of percentage of waste recycled by weight compared to total weight of construction waste to confirm a minimum of 25% of total waste has been recycled.

Unit Measure: TN / Unit Cost: varies
Healthy Living Environment

Paints, Caulks and Sealants

**5568 / PREP AND PAINT VACANT ROOM WITH NATURAL TRIM — LOW-VOC / CRITERIA 6.1, 6.2, 7.15 [MANDATORY]**

Using lead-safe work practices, remove and dispose of all loose material and dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond and fiberglass mesh tape. If plaster and lath boards are loose, re-secure or remove and replace with drywall patch. Repair all trim as necessary with a stainable wood filler shaped and sanded to match existing cross sections exactly. Sanding of any surfaces contacting or adjoining a lead-based painted surface shall be done with appropriate procedures such as using a HEPA-filtered sanding vacuum or a wet sanding method. Prime as necessary to seal stains, raw plaster, etc. Paint ceilings two coats in flat ceiling white and walls in eggshell or satin finish, cut-in neatly to trim and at all corners and edges. Clean and prep all woodwork, doors, and windows. Remove all paint, marks, dirt, etc., and blend finish in areas where it has been removed (gouges, etc.). Coat all trim using a combination stain/water-based finish of natural or golden oak color. All paints and primers must not exceed the following maximum VOC requirements: Flats 50 g/L; Non-flats 50 g/L; Floor 100 g/L; Anti-corrosive 250 g/L. All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District: [www.aqmd.gov/rules/reg/reg11/r1168.pdf](http://www.aqmd.gov/rules/reg/reg11/r1168.pdf). All caulks and sealants must comply with Regulation 8, Rule 51, of the Bay Area Air Quality Management District (BAAQMD).

*Unit Measure: SF / Unit Cost: $0.35*

**5567 / PREP AND PAINT VACANT ROOM WITH PAINTED TRIM — LOW-VOC / CRITERIA 6.1, 6.2, 7.15 [MANDATORY]**

Using lead-safe work practices, remove and dispose of all loose material and dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond and fiberglass mesh tape. If plaster and lath boards are loose, re-secure or remove and replace with drywall patch. Sanding of any surfaces contacting or adjoining a lead-based painted surface shall be done with appropriate procedures such as using a HEPA-filtered sanding vacuum or a wet sanding method. Prime as necessary to seal stains, raw plaster, etc. Paint ceilings two coats in flat ceiling white and walls in eggshell or satin finish, cut-in neatly to trim and at all corners and edges. Prep trim on doors and windows by de-glossing painted trim prior to painting. Apply two coats of latex semi-gloss paint to cover completely and uniformly. Colors are the choice of the Owner from stock colors. All paints and primers must not exceed the following maximum VOC requirements: Flats 50 g/L; Non-flats 50 g/L; Floor 100 g/L; Anti-corrosive 250 g/L. All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District: [www.aqmd.gov/rules/reg/reg11/r1168.pdf](http://www.aqmd.gov/rules/reg/reg11/r1168.pdf). All caulks and sealants must comply with Regulation 8, Rule 51, of the BAAQMD.

*Unit Measure: SF / Unit Cost: $0.35*
5610 / COLD CLIMATE VAPOR BARRIER PRIMER — LOW-VOC / CRITERIA 6.1, 6.2, 7.15 [MANDATORY]
Using lead-safe work practices, remove and dispose of all loose material and dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond and fiberglass mesh tape. If plaster and lath boards are loose, re-secure or remove and replace with drywall patch. Prime specified areas with a low-VOC vapor barrier primer such as Vimasco 749 Vapor-Blok to produce a coating with a perm rating of less than 1. All paints and primers must not exceed the following maximum VOC requirements: Flats 50 g/L; Non-flats 50 g/L; Floor 100 g/L; Anti-corrosive 250 g/L.
Unit Measure: SF / Unit Cost: $0.20

5677 / PREP AND PAINT EXTERIOR TRIM — LOW-VOC / CRITERIA 6.1, 6.2, 7.15 [MANDATORY]
Using lead-safe work practices, remove and properly dispose of all loose materials prior to installation of new materials, and prepare existing wood surfaces specified for stabilization prior to paint application by securing, replacing, or repairing all loose, broken, rotted, or deteriorated materials to provide a sound surface for paint application. Using lead-safe work practices and following paint manufacturer’s recommendations, prepare trim surfaces by removing all loose paint. Use a 25-year or better paintable low-VOC caulk matched for color to fill all cracks, voids, holes, etc., prior to painting. Apply a compatible exterior low-VOC primer to all bare wood areas. Apply two coats of quality exterior low-VOC paint to specified wood. All paints and primers must not exceed the following maximum VOC requirements: Flats 50 g/L; Non-flats 50 g/L; Floor 100 g/L; Anti-corrosive 250 g/L. All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District: www.aqmd.gov/rules/reg/reg11/r1168.pdf. All cauls and sealants must comply with Regulation 8, Rule 51, of the BAAQMD. Color is the choice of the Owner from stock colors. All work to be done in a neat and professional manner. Use care to protect all surfaces not intended for paint coverage.
Unit Measure: SF / Unit Cost: $0.72

Flooring

5971 / CARPET (BERBER) AND PAD — GREEN LABEL / CRITERION 7.2 [MANDATORY]
Install FHA-approved, nylon/olefin-blend Berber weave carpet. Install over a 0.5-inch medium density rebond pad with a minimum of seams in both pad and carpet. Carpet and pad must meet the Carpet and Rug Institute’s Green Label certification. Stretch carpet to eliminate puckers, scallops, and ripples. Include premium seam tape, tackless strips, and metal edge strips at transition to resilient, tile, or wood floors. New carpet to be seamed to carpet in adjoining rooms. Cover entire floor, including closets. Owner’s choice of color and style.
Unit Measure: SY / Unit Cost: $23

5972 / CARPET (CUT PILE) AND PAD — GREEN LABEL / CRITERION 7.2 [MANDATORY]
Install FHA-approved, nylon/olefin-blend cut pile weave carpet. Install over a 0.5-inch medium density rebond pad with a minimum of seams in both pad and carpet. Carpet and pad must meet the Carpet and Rug Institute’s Green Label certification. Stretch carpet to eliminate puckers, scallops, and ripples. Include premium seam tape, tackless strips, and metal edge strips at transition to resilient, tile, or wood floors. New carpet to be seamed to carpet in adjoining rooms. Cover entire floor, including closets. Owner’s choice of color and style.
Unit Measure: SY / Unit Cost: $23
5982  /  CARPET AND PAD STAIRS — GREEN LABEL  /  CRITERION 7.2 [MANDATORY]
Install FHA-approved, nylon/olefin-blend cut pile weave carpet on each tread in a waterfall application covering the full width of each tread. Open ends of treads will be wrapped with carpet to cover the entire tread. Install over a 0.5-inch medium density rebond pad with a minimum of seams in both pad and carpet. Carpet and pad must meet the Carpet and Rug Institute’s Green Label certification. Stretch carpet to eliminate puckers, scallops, and ripples. Include premium seam tape, tackless strips, and metal edge strips at transition to resilient, tile, or wood floors. New carpet to be seamed to carpet in adjoining rooms. Tackless strips the width of the treads are to be used at bottom of riser and on the tread adjacent to the riser. Owner’s choice of color and style.

Unit Measure: RI  /  Unit Cost: $18.00

5917  /  UNDERLAYMENT AND LINOLEUM COMPOSITION TILE  /  CRITERION 7.3 [OPTIONAL]
Install 0.25-inch underlayment-grade plywood using 7d screw Shank or cement coated nails, or coated narrow crown staples, 6 inches on center allowing a 0.25-inch gap at wall. Fill all seams in underlayment per linoleum manufacturer’s installation recommendations. Install 13” x 13” Forbo Marmoleum Composition Tile (MCT), per manufacturer’s most current recommendations. Owner’s choice of color.

Unit Measure: SF  /  Unit Cost: $7.50

5918  /  UNDERLAYMENT AND BIOBASED COMPOSITION TILE  /  CRITERION 7.3 [OPTIONAL]
Install 0.25-inch underlayment grade plywood using 7d screw Shank or cement coated nails, or coated narrow crown staples, 6 inches on center allowing a 0.25-inch gap at wall. Fill all seams in underlayment per manufacturer’s installation recommendations. Install 12” x 12” Armstrong BioBased Migrations floor tile per manufacturer’s most current recommendations using either S521 or S700 Armstrong adhesive. Owner’s choice of color.

Unit Measure: SF  /  Unit Cost: $5.50

5922  /  UNDERLAYMENT AND LINOLEUM SHEET GOODS  /  CRITERION 7.3 [OPTIONAL]
Install 0.25-inch underlayment grade plywood using 7d screw Shank or cement coated nails, or narrow crown staples, 6 inches on center allowing a 0.25-inch gap at wall. Fill seams with a manufacturer approved filler. Install Forbo’s Marmoleum or Armstrong Marmorette linoleum sheet goods per manufacturer’s most current recommendations. Owner’s choice of color.

Unit Measure: SF  /  Unit Cost: $9.50

2351  /  FLOOR — REFINISH WOOD LOW-VOC  /  CRITERION 7.2 [MANDATORY]
Countersink all nails and fill holes. Sand the entire floor including the edges using a 120 grit (or finer) sandpaper for the final sanding. Vacuum and tack rag room. Apply one coat of one of the following sealers by Basic Coating (Commercial Catalyzed Sealer, Hydroline Sealer, EZ Dry, or Emulsion), then apply two coats of StreetShoe® 275 that complies with regulation 8, rule 51, of the Bay Area Air Quality Management District and may not exceed 250 grams of VOC per liter of coating as thinned to the manufacturer’s maximum recommendation, excluding the volume of any water, exempt compounds, or colorant added to the tint bases.

Unit Measure: SF  /  Unit Cost: $2.75
Kitchen Cabinets

3716 / CABINET — WOOD BASE — PLYWOOD / CRITERION 7.1 [MANDATORY]
Remove and dispose off-site all existing cabinets, counters, ledgers, etc. Install base cabinets constructed of solid hardwood face-frames, doors, and draw fronts with 0.25-inch plywood carcasses and floors. Drawer boxes shall be plywood, joined using metal or plastic corner bracing. Install D-shaped pulls on all doors and drawers even when finger grooves exist. Owner will choose style and finish from those available in line proposed by contractor. Cabinets must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant.

Unit Measure: LF / Unit Cost: $156

3726 / CABINET — WOOD WALL — PLYWOOD / CRITERION 7.1 [MANDATORY]
Remove and dispose off-site all existing upper cabinets, counters, ledgers, etc.

Note: Upper cabinets will be either: a) 42 inches installed to ceiling, or b) 36 inches trimmed with a stained oak crown, or c) 36 inches with a trimmed drywall or plywood soffit. Install upper cabinets constructed of solid hardwood face-frames and doors. Carcasses will be joined using metal or plastic corner bracing. Install D-shaped pulls on all doors and drawers even when finger grooves exist. Owner will choose style and finish from those available in line proposed by contractor. Cabinets must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant.

Unit Measure: LF / Unit Cost: $120

3717 / CABINET — WOOD BASE / CRITERION 7.1 [MANDATORY]
Remove and dispose off-site all existing cabinets, counters, ledgers, etc. Install base cabinets constructed of solid hardwood face-frames, doors, and draw fronts. Drawer boxes shall be plywood. Carcasses will be joined using metal or plastic corner bracing. All particleboard and MDF components must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant. Install D-shaped pulls on all doors and drawers even when finger grooves exist. Owner will choose style and finish from those available in line proposed by contractor.

Unit Measure: LF / Unit Cost: $136

3727 / CABINET — WOOD WALL / CRITERION 7.1 [MANDATORY]
Remove and dispose off-site all existing upper cabinets, counters, ledgers, etc.

Note: Upper cabinets will be either: a) 42 inches installed to ceiling, or b) 36 inches trimmed with a stained oak crown, or c) 36 inches with a trimmed drywall or plywood soffit. Install upper cabinets constructed of solid hardwood face-frames and doors. Carcasses will be joined using metal or plastic corner bracing. All particleboard and MDF components must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant. Install D-shaped pulls on all doors and drawers even when finger grooves exist. Owner will choose style and finish from those available in line proposed by contractor.

Unit Measure: LF / Unit Cost: $110
3747 / REPLACE COUNTERTOP — PLASTIC LAMINATE / CRITERION 7.1 [MANDATORY]

Dispose of existing countertop. Field measure for sizing. All particleboard and MDF components must comply with California 93120 (formaldehyde content) or all exposed edges must be sealed with a low-VOC sealant. Screw to base cabinet a square-edged plastic laminate countertop. Provide end-caps and cutout for sink. Caulk countertop to adjoining walls with low-VOC caulking to match wall color. Owner’s choice of in-stock color and texture.

Unit Measure: LF / Unit Cost: $35

Radon

2040 / RADON — VENT CONCRETE SLAB (PASSIVE) / CRITERION 7.11 [MANDATORY for substantial rehab projects located in EPA Zones 1 and 2 areas if the radon level is above 4 pCi/L]

Create a sub-slab vent for radon gas by breaking up the specified portion of the slab and excavating to allow for a 4-inch concrete slab flush with the existing and 8 inches of 0.75-inch stone. Grade and tamp soil to provide solid base. Install the 0.75 inch stone and install a 6-inch PVC tee connected to a 4-inch PVC pipe in the stone base vented above the roof line to a Schedule 40 PVC screened exhaust cap and flashed to the roof with a metal based neoprene boot. The vent should be installed a minimum of 12 inches above the roof and a minimum of 10 feet away from any window or other opening that could bring the exhausted radon gases into the residence. Install a continuous 6 mil plastic vapor barrier between the stone and the concrete sealed carefully to the vent pipe. Pour a 4-inch 3000 psi concrete slab to match elevation of surrounding slab. Float and steel trowel finish. Seal all holes in the slab with concrete and seal all cracks with a low-VOC caulk.

Unit Measure: EA / Unit Cost: $1,400

2041 / RADON — VENT CONCRETE SLAB — SUMP (PASSIVE) / CRITERION 7.11 [MANDATORY for substantial rehab projects located in EPA Zones 1 and 2 areas if the radon level is above 4 pCi/L]

Create a sub-slab vent for radon gas by installing a 6-inch PVC tee connected to a 4-inch PVC pipe in the sump hole and vented above the roof line to a Schedule 40 PVC screened exhaust cap and flashed to the roof with a metal-based neoprene boot. Install a plastic sump cover designed specifically for sealing a radon vent to the sump hole. Seal all holes in the slab with concrete and seal all cracks with a low-VOC caulk.

Unit Measure: EA / Unit Cost: $900

2042 / RADON — SEAL, VENT, INSULATE CRAWL SPACE (PASSIVE) / CRITERION 7.11 [MANDATORY for substantial rehab projects located in EPA Zones 1 and 2 areas if the radon level is above 4 pCi/L]

Create a vent for radon soil gases in the crawl space. Install a 6 mil clear poly vapor barrier on ground in crawl space and up foundation walls to the top of the masonry, leaving an inspection gap of 3 inches between the lowest wood component and the plastic. Fasten the plastic to the masonry, wall with mechanical fasteners and large washers, and seal the plastic to the masonry with low-VOC sealant rated to adhere to plastic. Overlap seams in the plastic by 3 feet and seal the seams with fiberglass mesh tape and mastic. The end product will provide a water- and air-tight seal between the interior of the crawl space and the walls and floor of the crawl space, and all penetrations including but not limited to those created by plumbing, electrical, and HVAC equipment will be sealed tight. Install a 6-inch PVC tee under the plastic vapor barrier connected to a 4-inch PVC pipe that is sealed to the plastic vapor barrier and vented above the roof line to a Schedule 40 PVC screened exhaust cap and flashed to the roof with a metal-based neoprene boot.

Unit Measure: SF / Unit Cost: $3.30
2043 / RADON — MAKE PASSIVE SYSTEM ACTIVE / CRITERION 7.11 [MANDATORY]
Install a Fantech HP 2190 radon fan unit in specified location wired directly to the electrical panel from a junction box installed within 6 feet of the fan. Use rubber boots to connect the fan to the 4-inch vent.

Unit Measure: EA / Unit Cost: $350

Pest Control

8395 / INTEGRATED PEST MANAGEMENT / CRITERION 7.14 [MANDATORY]
Do not use any insecticides. Use Integrated Pest Management methods to control pests. Seal all cracks, holes, and crevices on interior surfaces and exterior surfaces with low-VOC caulks to prevent access by pests. Use Stuff-it copper mesh by Do-it-Yourself Pest Control (www.doyourownpestcontrol.com) to plug larger holes prior to finishing with plaster or drywall. Do not use steel wool. Place a thin dusting of 98% boric acid under kitchen cabinets, and in wall cavities, cracks, and crevices in the kitchen.

Unit of Measure: DU / Unit Cost: $300

Ventilation

7836 / ENERGY STAR KITCHEN RANGE HOOD — VENTED / CRITERION 7.5A [MANDATORY for substantial rehab] AND 7.5B [OPTIONAL for selective rehab]
Install an exterior ducted enameled ENERGY STAR qualified range hood with integral minimum two-speed fan control and light switched separately, capable of a minimum 150 CFM at a maximum of 7 sones, such as the Broan QSE130 series. Attach hood to cabinet with screws. Include galvanized metal vent and seal all duct seams with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9, and roof or wall cap/damper assembly flashed appropriately for the exterior finish. Owner’s choice of color.

Unit Measure: EA / Unit Cost: $350

7819 / ENERGY STAR FAN/LIGHT FIXTURE / CRITERIA 5.5A, 7.4A [MANDATORY for substantial rehab] AND 7.4B [OPTIONAL for selective rehab]
(Include under Electrical)
Install an ENERGY STAR qualified ceiling mounted fan/light fixture, with a 6-inch duct outlet, such as the Broan QTXE080FLT capable of minimum 80 CFM operating at 1 sone or less, with an integral damper, and vented to the exterior. The fixture must accommodate two GU24 fluorescent lamps. Switch fan and light using a single switch with a time delay for the fan such as the EFI Fan/Light Time Delay Switch part #5100.505 (in Ivory) www.energyfederation.org/consumer/default.php/cPath/39_766_134 or equipped with a humidistat sensor. Install galvanized metal duct the same diameter as the fan outlet and vent to the exterior, ideally through a wall or gable end using a vent of like diameter with a damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling installation, and air-seal fan/light assembly to the ceiling with low-VOC caulk.

Unit Measure: EA / Unit Cost: $225
7821 / ENERGY STAR FAN/LIGHT FIXTURE — CONTINUOUS WITH MOTION ACTIVATED BOOST / CRITERIA 5.5A [MANDATORY], 7.4A, 7.6A [MANDATORY for substantial rehab] AND 7.4B, 7.6B [OPTIONAL for selective rehab]

Install a Panasonic Whisper Green-Lite Model #FV-08VKML3 ceiling-mounted, ENERGY STAR qualified fan/light fixture with a modulating DC motor capable of 80 CFM operating at less than 0.3 sones, switched by a built-in motion detector and nightlight, the capacity to run continuously at a preset CFM rating, a time delay feature for the boost setting, vented with damper to exterior. Install additional nonmetallic cabling per wiring instructions to complete the required electrical connections. Install 4-inch galvanized metal duct (not flex duct) and vent to the exterior ideally through a wall or gable end using a 4-inch hooded vent with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling installation and air seal fan/light assembly to the ceiling with low-VOC caulk. Set the continuous level of ventilation to meet ASHRAE 62.2 and set the time delay switch to 20 minutes.

Unit Measure: EA / Unit Cost: $325

7822 / ENERGY STAR FAN/LIGHT FIXTURE — CONTINUOUS WITH SWITCH ACTIVATED BOOST / CRITERIA 5.5A [MANDATORY], 7.4A, 7.6A [MANDATORY for substantial rehab] AND 7.4B, 7.6B [OPTIONAL for selective rehab]

Install a Panasonic Whisper Green-Lite Model #FV-08VKSL3 ceiling mounted ENERGY STAR qualified fan/light fixture with a modulating DC motor capable of 80 CFM operating at less than 0.3 sones, with a nightlight, the capacity to run continuously at a preset CFM rating, a time delay feature for the boost setting, vented with damper to exterior. Install additional nonmetallic cabling per wiring instructions to complete the required electrical connections. Switch both the fan and light using a single-pole switch. Install 4-inch galvanized metal duct (not flex duct) and vent to the exterior, ideally through a wall or gable end using a 4-inch hooded vent with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling installation and air seal fan/light assembly to the ceiling with low-VOC caulk. Set the continuous level of ventilation to meet ASHRAE 62.2 and set the time delay switch to 20 minutes.

Unit Measure: EA / Unit Cost: $350

7823 / EXHAUST FAN WITH CONTINUOUS MODULATING — MOTION DETECTOR SWITCH / CRITERIA 5.5A [MANDATORY], 7.4A, 7.6A [MANDATORY for substantial rehab] AND 7.4B, 7.6B [OPTIONAL for selective rehab]

Install a Panasonic Whisper Green Model #FV-08VKM3 ceiling mounted ENERGY STAR qualified exhaust fan fixture with a modulating DC motor capable of 80 CFM operating at less than 0.3 sones, switched by a built in motion detector and nightlight, the capacity to run continuously at a preset CFM rating, a time delay feature for the boost setting, vented with damper to exterior. Install additional nonmetallic cabling per wiring instructions to complete the required electrical connections. Install 4-inch galvanized metal duct (not flex duct) and vent to the exterior ideally through a wall or gable end using a 4-inch hooded vent with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-8 minimum duct insulation. Repair any damage to the ceiling installation and air-seal fan/light assembly to the ceiling with low-VOC caulk. Set the continuous level of ventilation to meet ASHRAE 62.2, and set the time delay switch to 20 minutes.

Unit Measure: EA / Unit Cost: $275
7824 / EXHAUST FAN WITH CONTINUOUS SWITCH ACTIVATED BOOST — GCI / CRITERIA 5.5A
[MANDATORY], 7.4A, 7.6A [MANDATORY for substantial rehab] AND 7.4B, 7.6B [OPTIONAL for selective rehab]
Install a Panasonic Whisper Green Model #FV-08VKS3 ceiling-mounted ENERGY STAR qualified exhaust fan fixture with a modulating DC motor capable of 80 CFM operating at less than 0.3 sones, the capacity to run continuously at a preset CFM rating, a time delay feature for the boost setting, and vented with damper to exterior. Install additional nonmetallic cabling per wiring instructions to complete the required electrical connections. Switch fan using a single-pole switch at the entry or equip the fan with a humidistat sensor. Install 4-inch galvanized metal duct (not flex duct) and vent to the exterior, ideally through a wall or gable end using a 4-inch hooded vent with damper. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Insulate the ductwork with vinyl- or foil-faced R-6 minimum duct insulation. Repair any damage to the ceiling installation and air-seal fan/light assembly to the ceiling with low-VOC caulk. Set the continuous level of ventilation to meet ASHRAE 62.2 and set the time delay switch to 20 minutes.
Unit Measure: EA / Unit Cost: $300

6042 / ACTIVE FRESH AIR INTAKE — FORCED AIR SYSTEM — APRILAIRE / CRITERIA 7.6A [MANDATORY for substantial rehab] AND 7.6B [OPTIONAL for selective rehab]
Install an Aprilaire Model #8126 Ventilation Control System with temperature and humidity shuttoffs to add fresh exterior air to the return plenum of the forced air HVAC system. Use 30-gauge rigid duct insulated with minimum R-6 vinyl- or foil-faced duct insulation. The inlet should be carefully located on an outside wall to avoid the addition of contaminants or moisture into the return air system and must be placed a minimum of 10 feet away from sources of auto exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents. www.aprilaire.com
Unit Measure: EA / Unit Cost: $375

6043 / ACTIVE FRESH AIR INTAKE — FORCED AIR SYSTEM — SKUTTLE / CRITERIA 7.6A [MANDATORY for substantial rehab] AND 7.6B [OPTIONAL for selective rehab]
Install a 6-inch duct Skuttle #216 Make Up Air Control to add fresh exterior air to the return plenum of the forced air HVAC system and adjust damper to operate as specified. Use 30-gauge rigid duct insulated with minimum R-6 vinyl- or foil-faced duct insulation. The inlet should be carefully located on an outside wall to avoid the addition of contaminants or moisture into the return air system and must be placed a minimum of 10 feet away from sources of auto exhaust, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units, or bath and kitchen exhaust fan vents. www.skuttle.com/216.html
Unit Measure: EA / Unit Cost: $150

6003 / PASSIVE FRESH AIR INTAKE / CRITERIA 7.6A, 7.6B [OPTIONAL; may be prudent]
In conjunction with using an exhaust fan that runs continuously or on a timer to satisfy the requirements of ASRHAE 62.2-2010 (Spec #7824), install a Tamarack passive intake vent through the specified exterior wall, flashed to be weather-tight, and sealed to the building envelope’s air barrier and interior and exterior finishes. The inlet should be carefully located on an outside wall to avoid the addition of contaminants or moisture into the return air system and must be placed a minimum of 10 feet away from sources of auto exhaust, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units, or bath and kitchen exhaust fan vents.
Unit Measure: EA / Unit Cost: $125
6415 / CLOTHES DRYER VENT / CRITERION 7.7 [MANDATORY]
Install 4-inch round rigid galvanized ductwork from the specified dryer location to a wall-mounted Heartland Dryer Vent Closure outlet. www.energyfederation.org/consumer/default.php?cPath/30_4287_4571. Do not fasten with nails, screws, or other fasteners that protrude into the interior of the exhaust duct. Use pop rivets to connect sections of duct. All duct seams shall be sealed with a low-VOC, spreadable mastic such as RDC Corp. #7, #8, or #9. Secure duct and hood to framing.

Unit Measure: EA / Unit Cost: $65

4955 / CRAWL SPACE VAPOR BARRIER / CRITERION 7.10 [MANDATORY]
Install a 6 mil poly vapor barrier on ground in crawl space and up foundation walls to the top of the masonry leaving an inspection gap of 3 inches between the lowest wood component and the plastic. Fasten the plastic to the masonry wall with mechanical fasteners and large washers, and seal the plastic to the masonry with low-VOC caulk, rated to adhere plastic. Overlap seams in the plastic by two feet and seal the seams with fiberglass mesh tape and spreadable mastic.

Unit Measure: SF / Unit Cost: $0.65

4957 / CRAWL SPACE — VAPOR BARRIER AND INSULATION / CRITERION 7.10 [MANDATORY]
Install a 6 mil poly vapor barrier on ground in crawl space and up foundation walls to the top of the masonry leaving an inspection gap of 3 inches between the lowest wood component and the plastic. Fasten the plastic to the masonry wall with mechanical fasteners and large washers, and seal the plastic to the masonry with low-VOC caulk rated to adhere plastic. Overlap seams in the plastic by two feet and seal the seams with fiberglass mesh tape and spreadable mastic. After the plastic vapor barrier has been inspected and approved by the Owner, install a minimum R-13 of Dow Thermax foam board on the outside walls of the crawl space, sealing the seams between the boards with foil tape approved by Dow for use with Thermax. The layer of Thermax shall be complete without voids, and any gaps shall be sealed with polyurethane foam sealant.

Unit Measure: SF / Unit Cost: $0.95

4727 / ROOF VENTILATION — COMBINED SOFFIT AND RIDGE
Install 1 square foot of combined soffit and ridge ventilation for every 300 square feet of attic floor area. A minimum of 40% of the total required ventilation must be provided by the free air space rating of ridge vents. A minimum 60% of the total required ventilation must be provided by the free air space rating of soffit vents. All vents must be screened and, if exposed, must be factory painted.

Unit Measure: SF / Unit Cost: $12
Water, Moisture and Mold Management

4981 / INSULATE DOMESTIC WATER SUPPLY PIPE
Insulate exposed hot and cold water mains with closed cell polyethylene slip-on pipe insulation, sized to fit the pipe’s diameter. Seal seams with either 5 mil pipe insulation sealing tape or closure clips designed for pipe insulation placed every four inches. Seal all butt joints between sections of pipe with 5 mil pipe insulation sealing tape. Neatly miter all angled junctions.

Unit Measure: LF / Unit Cost: $1.25

5416 / TILE BACKER BOARD — CEMENTITIOUS / CRITERION 7.9C [MANDATORY]
Install 0.5-inch fiberglass reinforced cement composition boards such as Durock® or HardieBacker™ in area specified to accept ceramic tile. Space edges 0.25 inches from adjoining surfaces and fasten with minimum 1.25-inch-long No. 8 x 0.375" HD self-drilling corrosion-resistant ribbed wafer-head screws (e.g., High-Low Rock On screws) designed specifically for backer board. Use product specified by manufacturer for particular application (such as walls or floors). For floors, bond backer board to plywood subfloor with thinstock mortar using a 0.25-foot-square notched trowel. On walls, all edges of backer boards must be supported by full face 2-foot framing secured to the structure. On floors, backer board must be installed on 0.75-foot plywood over joists 16 inches on center, or the joist/subfloor assembly must meet the manufacturer’s specifications.

Unit Measure: SF / Unit Cost: $3.25

912 / BASEMENT SLAB INSTALLATION / CRITERION 7.10 [MANDATORY]
Install a continuous 4-inch-thick basement slab using a 3,000 psi mix. Make sure that the soil is uniformly and properly compacted. Install a 4-inch bed of 0.75-inch clean (no fines) gravel on top of the soil, provide expansion joints (also known as isolation joints) around the inside perimeter of the foundation using standard isolation joint material, and install 6 mil polyethylene sheet directly under the concrete to create a continuous vapor barrier, ideally in one sheet but lapped 12 inches and taped at seams if seams are absolutely necessary. Include plastic reinforcing fibers in the mix, like Fibermesh (Fibermesh Co., 4019 Industry Dr., Chattanooga, TN 37416; 615-892-7243.) Screed, float, and finish with a steel trowel to a smooth surface that drains water to any existing drains, and strike control joints in the wet concrete at 8-inch intervals.

Unit Measure: SF / Unit Cost: $4.50

2567 / SIDING — HARDIPLANK
Prepare surface by removing nails, repairing sheathing, and applying house-wrap and Hardiplank siding. Install 1" x 8.25" Hardiplank lap siding to the surface using hot-dipped galvanized nails or stainless steel nails driven at least 1 inch into studs. Stagger joints in adjacent pieces and center all butt joints over studs. Either install joints with a 3mm gap filled with Hardiplank caulking compound or butt together without jointing compound. If not installing with a caulk-filled gap, install a piece of Hardiplank-approved sheeting behind each joint to flash the vertical seam. Where Hardiplank butts up against an accessory, fill joint with a 6mm fillet of Hardiplank caulking.

Unit Measure: SF / Unit Cost: $3.50
2569 / SIDING — HARDIPLANK WITH RAINSCREEN
Prepare surface by removing nails, repairing sheathing, and applying house-wrap and Hardiplank siding. Install 1" x 4" furring strips over the house-wrap, vertically aligned with the studs in the wall framing and attached with screws that penetrate a minimum 1.5 inches into the studs, of a sufficient gauge to support the siding assembly. Install 1" x 8.25" Hardiplank lap siding to the furring strips using hot-dipped galvanized nails or stainless steel nails per the National Evaluation Services, Inc. NER-405 Report requirements. See www.jameshardie.com/pdf/USTB_Attaching-James-Hardie-Products-Over-Rain-Screen.pdf for details. Stagger joints in adjacent pieces and center all butt joints over studs. Either install joints with a 3mm gap filled with Hardiplank caulking compound or butt together without jointing compound. If not installing with a caulk-filled gap, install a piece of Hardiplank-approved sheeting behind each joint to flash the vertical seam. Where Hardiplank butts up against an accessory, fill joint with a 6mm fillet of Hardiplank caulking.

Unit Measure: SF / Unit Cost: $4.70

8722 / CARBON MONOXIDE DETECTOR / CRITERION 7.8 [MANDATORY]
Install at each sleeping area, minimum of one per floor, a hard-wired or plug-in CO detector with audible alarm, battery backup, and a digital display capable of showing both peak CO level recorded by the alarm since it was last reset or unplugged and the present level of CO the unit is sensing.

Unit Measure: EA / Unit Cost: $75
Energy Auditing and Building Performance Services

ENERGY STAR RATING — SUBSTANTIAL REHAB WITH PERFORMANCE PATH

Provide professional services of a RESNET certified Rater to produce an ENERGY STAR Rating for the specified home using the Home Energy Rating System (HERS). Using the provided specifications, the HERS Rater will create an energy model for both the pre-housing rehabilitation condition and for the projected condition post-housing rehabilitation. During construction, the HERS Rater will provide all required ENERGY STAR inspection services to verify that all requirements have been met in accordance with the mandatory requirements for all ENERGY STAR Homes and with RESNET’s On-Site Inspection Procedures for Minimum Rated Features. The Rater will also provide the final post-construction test-outs to complete the ENERGY STAR Rating. The Rater will also provide technical assistance on optional methods and materials to reach the ENERGY Star Rating or to improve the ENERGY STAR scoring of the specified home.

Unit Cost: $750

ENERGY AUDITING SERVICES

Provide professional services of a RESNET certified Rater to rate the specified home using the HERS for both the pre-housing rehabilitation condition and for the projected condition post-housing rehabilitation using the specifications provided. The Rater will also provide technical assistance on optional methods and materials to reach the performance threshold of a HERS score of 85 to meet the Enterprise Green Communities Criteria, or the owner’s preferred HERS Rating or to improve the HERS scoring of the specified home beyond either threshold.

Unit Cost: $450

CONSTRUCTION APPLIANCE ZONE TESTING

Provide professional services of a Building Performance Institute (BPI) certified Building Analyst Professional to complete both preliminary and post-air sealing and insulation installation safety inspection of all combustion appliances. This inspection includes all of the following tests: carbon monoxide (CO) measurement at each appliance, draft measurement and spillage evaluation for atmospherically vented appliances, and worst-case negative pressure measurement for each combustion appliance zone (CAZ). Based on the combustion safety test results, the BPI Building Analyst Professional will provide recommendations based upon the BPI Combustion Safety Action Level table.

Unit Cost: $290