King County Housing Authority

EXHIBIT F

INSTALLATION AND MATERIALS REQUIREMENTS

The Washington State Weatherization Manual, the Washington State Weatherization Field Guide, and the NREL Standard Work Specifications (SWS) for Home Energy Upgrades are provided by the State Department of Commerce to agencies that coordinate low income weatherization programs throughout the state. The documents clarify program requirements that agencies (frequently referred to as the state's "contractor") must follow, including detailed specifications, installation procedures, and related project documentation. Contractors responding to this RFP must comply with areas of each of the above-mentioned documents that apply to their work, e.g., installation of measures, warranties, certificates of insulation, documentation of pressure readings, etc. Contractors are not asked to comply with requirements that clearly are intended for agencies, e.g., computerized analysis, general program oversight, quality control inspections, etc.

All work that may disturb lead-based paint must be performed in accordance with Lead Safe Weatherization (LSW) practices and the Renovation, Repair, and Painting (RRP) Rule. Contractors must document crew certification for utilizing LSW and RRP. Failure to utilize LSW and RRP, where required, may necessitate immediate work stoppage, clearance testing, relocation of occupants, clean-up, and/or legal claims. Contractors are responsible for costs of activities that arise from failure to follow the lead-safe protocol.

KCHA promotes a sustainable approach to conducting its home repair and weatherization programs. Contractors are encouraged to utilize "green" materials and products wherever possible and make every effort to recycle waste material.

TIME AND MATERIALS CHARGES—ALL HOUSING TYPES

For work that is unique to a particular project and not included in the RFP, the contractor will be asked to provide a detailed cost estimate of the time involved and the materials required to accomplish the work item(s). The KCHA Construction Coordinator will either: 1) obtain the estimate from the contractor prior to issuance of the Statement of Work Items so that the pricing can be included; or, 2) add the work by change order after the Statement of Work Items is issued. In all cases, the Construction Coordinator will develop an independent cost estimate for comparative purposes.

Examples of work that will be based on time and materials estimate are the additional set-up and clean-up activities associated with Lead Safe Work, the scopes of which will vary among projects.

In addition, repairs identified by the contractor while undertaking the weatherization project that are critical to completing weatherization activities may also be carried out based on a time and materials estimate. These repairs require the **prior approval of KCHA via a change order**. The contractor will be required to submit an invoice that compares the detailed time and materials estimate with actual costs-- *materials used, number of man-hours worked and associated charges*.

Please note the descriptions below refer to specific building types and are divided between Multifamily, Mobile home and Single family. The work items may appear on all three building types; however, the specific information covered in Exhibit F is noted for the specific project type.

UNIT PRICES

Please note that the following requirements, which correspond to items listed on Exhibit E, are ***in addition*** to the guidance in the *Field Guides and SWS*. These additional requirements provide greater detail for particular items; item numbers that are not listed here do not have greater detail than is contained on the price list. The *Field Guides and SWS* continue to apply to all activities.

Ensure that you are selecting the correct unit price when entering materials, labor, overhead and profit costs. A miscalculation in your unit price can impact your bidding with either a loss or an overestimate of costs.

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MULTIFAMILY PROJECTS

INFILTRATION

***A1*. Door weather-strip kit**: Includes removal of existing weather-stripping and installation of kit with metal supporting system. Acceptable types include Quolon, Thermal Brush and vinyl bulbs. Foam tape is not acceptable.

***A7-A8*. Box over non-IC rated fixture:** A solid flame-resistant enclosure securely attached over or around recessed lighting or other heat producing fixtures made of metal or sheet rock. Must keep insulation at least 3 inches and not more than 4 inches from the fixture and be air sealed and fastened to the ceiling structure to prevent movement during insulation application. Extend at least 4 inches above the top of insulation.

***A9-A16*. Air seal attic/Air seal underfloor**: For multifamily buildings, air sealing will be performed in attics or under floors and priced per sq. ft.

Price to include sealing all penetrations in attic floor, including electrical and plumbing penetrations, all points where dissimilar materials are abutted in the thermal air barrier (top plates, sheetrock joints), and all points where there is a change in plane of the air barrier (knee wall/ ceiling connections). Materials used shall be installed in accordance with manufacturer specifications and all local codes. All penetrations in the attic floor shall be air sealed irrespective of clearance in the attic space above the attic floor.

***A23*. Air seal top plate-walls on top of concrete:** Access interior of wall cavity and install air barrier to prevent loose fill dense pack material from cascading down interior of concrete stem wall. Reinstall siding and subsiding to original condition, persevering weather resistant envelope.

***A24*. Air seal apartment marriage line walls**: Dense pack loose fiberglass wall insulation with summer hose such that material will accumulate and provide an air barrier at the perimeter. Price per (8) feet of marriage line.

A25. **Air Sealing Fire Box and Chimney Flue**: Clean and prepare penetrations for the vents on face as well as the chimney opening. Insert R38 rock wool bat inside chimney flue for thermal break. Penetrations to be air-sealed with 26-gauge sheet metal and fire caulking either of the same color as or painted to match the fire box.

A26. **Capping Chimney Penetration on Roof**: Clean and prepare the penetrations of the chimney opening. Insert R38 rock wool insulation batt inside chimney flue for thermal break. Penetrations to be air sealed with 26-gauge sheet metal cap and fire caulking either of the same color as or painted black.

ATTIC INSULATION

***B3*. Remove attic insulation - Loose fill**: Remove and properly dispose of all existing attic blown insulation, except vermiculite.

***B4*. Remove attic insulation - bat**: Remove and properly dispose of all existing attic batt insulation.

B5. **R-11 on ceiling: cellulose, loose fill (Includes installation of baffles/dams up to 5 per 1000 sq. ft.):** R-11 on ceiling: cellulose, loose fill including installation of baffles (Assume 5 low vent baffles per 1000 sq. ft. of heated attic space, for additional baffles see B6), dams, electrical connection and depth markers.

B13. **Tent existing sprinkler distribution system:** per the National Renewable Energy Lab Standard work specifications 3.0103.1 (Price per linear feet; the sprinkler head is included in this price structure).

ATTIC ACCESS / VENTILATION

C2. **Lockable Energy efficient ceiling access**: Prefabricated attic access to contain sturdy, compact housing (2'x4', continuous soft weather strip, finished solid door panel, and molding or self-trimming flange). Refer to the following website for clarification of one prefabricated option: www.conservationtechnology.com

C3. **Energy efficient knee wall access**: Prefabricated knee wall access to contain sturdy, compact housing (2'x4', continuous soft weather strip, finished solid door panel, and molding or self-trimming flange).

C4. **Eave vent without thermal bridging (22.5 x 3.5):** Outer 13.5" x 1" area to be screened with 1/8", 28-gauge galvanized metal for a net free area of 11.5 square inches.

C5. **Eave vent without thermal bridging (22.5 x 5.5):** Middle 21.5" x 2.5" area to be screened with 1/8", 28-gauge galvanized metal for a net free area of 43 square inches.

WALL INSULATION

D23. **Flame Spread Barrier**: Insulation facing material meeting ASTM-E-84 specifications, typically used to cover fiberglass wall insulation in an area seldom accessible to humans; storage rooms, basements.

D24. **Weather Resistive Barrier:** Insulation cover material used to prevent convection heat loss on the back side of fiberglass insulation, typically used in knee wall applications to achieve six-sided insulation.

FLOOR INSULATION

E1. **Remove floor insulation**: Remove and properly dispose of all existing floor insulation.

E11. **Slab on grade insulation**: Remove loose soil to 2" below grade and/or vegetation next to the slab. Clean the exposed slab, removing any earth that may impact the performance of the insulation. If necessary, cut the bottom of the siding. The new edge of the siding shall be below the edge of the top of the concrete slab ½ inch. Any siding cut will be treated to support a weatherproof surface. Loosen the bottom of the siding by removing the bottom nails and prepare for the installation of flashing. Preparation includes air sealing between the mudsill plate and the cement slab and applying a waterproof coating to the exposed slab.

Install flashing such that top leg is installed under the existing wall vapor retarder, with a ½ inch gap at least between the bottom of the siding and the flashing, and the bottom leg of the flashing is

parallel to the insulation. The middle of the Z in the flashing will be installed with a slight slope away from the building. Flashing shall be a z configuration. Flashing shall be metal, with a hemmed drip edge. The top leg of the flashing shall be at least 4" long. The bottom leg of the flashing will be at least 1". Install an R-10 rigid mineral insulation board (e.g., Roxul drain board or approved equal) to the edge of the slab per manufacturer's specifications. Rigid insulation will have no gaps, voids or overlapping. Install a permanent protective board over the insulation. The protective board will be painted to match the siding. The protective board will be mechanically fastened to the concrete slab at exterior points of the protective cover such that the protective cover shall not move if kicked by an adult. Z flashing will span rigid board insulation and protective cover. Exterior corners of the flashing and protective cover board will be designed and installed to provide continuous cover without sharp edges or points.

***E13*. Cantilever floor, open to the outside**: For an open cantilever floor insulate the full thickness of the floor and cover with 3/8-inch exterior grade or pressure treated sheathing to protect the installation. If area is in a visible location or subjected to intermittent moisture (i.e., splash back, etc.) prime & paint sheathing on all exposed sides.

CRAWL

***F2*. Rescreen existing vent**: To be ¼" metal galvanized.

***F4*. Vent Well**: Metal pre-formed mechanically attached with coated fasteners.

***F7*. Ground cover Removal of existing vapor barrier:** When necessary to remove existing vapor barrier prior to installation of new vapor barrier a charge for labor and disposal will be provided per sq. ft. A new vapor barrier will be a separate line-item charge.

***F8*. Closeable crawl space vent**: Manufactured or site built, vent to be compatible with existing opening or new penetration to support the enclosure's performance on weather and vermin protection. Vent to have long term life.

***F9*. Disinfecting Crawl:** Apply a Mold bomb fogger per manufacturer instructions. (Price per square-foot)

OTHER INSULATION

***G3*. Atypical Spaces (cellulose):** Atypical spaces are unique cavities in the envelope that can sometimes be dense packed with insulation to provide an airtight assembly. Price asked for is for material only in this installation. Material is cellulose treated with 100% borate. Time needed to install the material will be discovered at the installation.

***G4*. Atypical Spaces (fiberglass):** Atypical spaces are unique cavities in the envelope that can sometimes be dense-packed with insulation to provide an airtight assembly. Price asked for here is for material only in this installation. Material is loose fill fiberglass. Time needed to install the material will be discovered at the installation.

***G5*. Atypical Spaces (under bathtub):** A common building detail is bathtub mounted on an exterior wall. Provide a price to dense pack the cavity below the tub with loose fill fiberglass.

G6. **Access to enclosed areas without door, close and match existing finished:** During an energy audit, inaccessible areas are found that need access to perform effective air sealing. Access is made to allow effective air sealing and or insulation. After air sealing and our insulation work is complete, the access point needs to be reconstructed to match adjoining areas as originally found. Cut access to an enclosed space, under stairwells and chases.

MISC. LOW COST

***H1*. Pipe Wrap at Water Heater:** All plumbing water accessible within mechanical room having the water storage tank without removing fixed building components, water heater shall be insulated regardless of length. Typical instance would be the standard 50-gallon electric hot water tank in an apartment closet. Price is each for per water heater per closet area. Only pipe wrap suitable for human contact is allowed, no fiberglass.

MECHANICAL VENTILATION

I6. Wall termination blocking: Provide and install blocking for exterior wall ventilation cap, flashed and incorporated into the exterior drainage plane. Blocking shall match existing side and provide a weathertight assembly.

GENERAL/ OPTIONAL

This section is the ONLY optional price. If the contractor is not equipped to perform the blower door testing, they can opt out of including this price.

***K1*. Shell blower door (whole building, 4-plex):** Conduct a whole building depressurization test to ASTM-3158 standard, with 5 pressure points and a confidence level greater than 95%. Testing shall be conducted using blower door manufacturer software. Intentional openings of the envelope (Including trickle vents) and all parts of the mechanical ventilation system shall be sealed as part of the pre-test and post-test. Records of the test shall be given with the invoice, including individual fan readings per period of record. The minimum size for pricing will be a four-plex with independent apartment entries.

***K2*. Shell blower door (whole building, above 4 units, not double loaded corridor):** This is a price to add an added apartment to the test described in M3. If the building needed to be tested is a six-plex, the cost will be the cost of the four-plex named in M3 plus two added costs found here. The standard for the test is identical to M3.

SINGLE FAMILY WORK ITEM LIST

ATTIC INSULATION

B10. Flame spread barrier (min. flame spread rating of 25): to be used additionally as rodent barrier in crawlspace, where applicable.

B11. TPO Roof (MH): Roofing products and installation techniques to be in accordance with manufacturer's instructions and Washington State Department of Labor and Industries (L&I) requirements. Materials are to meet ASTM (American Society for Testing Materials) standards. Contractor to have available on site the manufacturer's material safety data sheets (MSDS) and installation instructions as well as any ICBO approvals. Install appropriate flashing for awnings where gutters do not fit. Thermoplastic Polyolefin (TPO) single-ply membrane is to be minimum 45 mils (.045"). A minimum rooftop insulation level of R-9 is to be included in work item cost. Insulation should meet roofing installation specifications. Manufacturer is to warrant the roof material for a minimum period of twelve years. Contractor is to warrant labor for a minimum period of five years. Both warranties are to be transferable to subsequent homeowners. Contractor to initiate manufacturer's warranty and assure homeowner is in receipt of warranty at job completion. Alteration Permit with L&I required. Evidence of approved permit and registered warranty are to be submitted with invoice. Contractor is responsible for establishing with L&I the process for obtaining Alteration Permit.

B12. EPDM Roof (MH): Roofing products and installation techniques to be per manufacturer's instructions and Washington State Department of Labor and Industries (L&I) requirements. Materials are to meet ASTM (American Society for Testing Materials) standards. Contractor to have available on site the manufacturer's material safety data sheets (MSDS) and installation instructions as well as any ICBO approvals. Install proper flashing for awnings where gutters do not fit. Ethylene Propylene Diene Monomer (EPDM) single-ply membrane is to be minimum 45 mils (.045"). A minimum rooftop insulation level of R-9 is to be included in work item cost. Insulation should meet roofing installation specifications. Manufacturer is to warrant the roof material for a minimum period of twelve years. Contractor is to warrant labor for a minimum period of five years. Both warranties are to be transferable to subsequent homeowners. Contractor to initiate manufacturer's warranty and assure homeowner is in receipt of warranty at job completion. Alteration Permit with L&I required. Evidence of approved permit and registered warranty are to be submitted with invoice. Contractor is responsible for establishing with L&I the process for obtaining Alteration Permit.

WINDOWS / DOORS

Window installations are to comply with local building codes and manufacturer's instructions. Include tempered glass where required. Where frame vents are required (air inlets), installation must comply with Home Ventilating Institute requirements. Screens are to be included for all vented windows. Weatherization contractors are responsible for verifying all measurements. All newly installed wood must be primed and painted or sealed.

Site Built Single family: Window installations to be integrated into the building with the existing water drainage system. Building paper, flashing, sill pans, and self-adhesive tapes are to be utilized

to assure the integrity of water drainage. Replacement window *nail flanges to remain intact* (unless prior approval from KCHA is obtained for removal of flanges) and the new window to be reincorporated into the building assembly. Sliding glass doors are to be installed such that the decking assembly is incorporated within the water drainage assembly.

Where LSW is noted, Lead Safe Weatherization practices must be utilized to reduce hazards associated with lead-based paint. Window installation is to include all necessary trim and sealant for both the interior and exterior. All newly installed wood must be primed and painted or sealed.

Replacement windows for homes located near Sea-Tac Airport may require a permit with the local jurisdiction. If applicable, contractor has to comply with Sound Transmission Coefficient requirements and obtain city permit. Provide add-on price for Sound Glass.

Mobile Homes: Replacement window nail flanges to remain intact (unless prior approval from KCHA is obtained for removal of flanges). The nail-flange at header of the rough opening is to be installed behind the mobile home siding, or an approved head flashing must be installed. Both jamb flanges and sill flange to be installed with butyl-tape between the siding and the window-flange. Window flanges to be fastened from the outside with oval-head stainless steel fasteners. Where necessary, use PVC for interior trim; pre-primed tight knot 1 x 4 wood trim boards or cedar boards for exterior trim.

The window and wall construction of manufactured homes is similar to that in single family construction. Therefore, replacement windows for manufactured homes should follow the specifications and pricing noted for single family homes.

I1. Replacement window: Provide a price for replacing a single window that is 9 sq. ft. or less. This price applies to both operable and non-operable windows. This line will not be used when installing more than one window, or one window that is more than 9 sq. ft.

I2. Replacement windows: greater than 200 sq. ft. per work order: Provide a price for replacing a single window that is 9 sq. ft. or less. This price applies to both operable and non-operable windows. This line will not be used when installing more than one window, or one window that is more than 9 sq. ft.

***I18-I10.* Glass**: Price per square foot assumes a minimum charge for all re-glazed windows. The minimum, regardless of how small the window may be, is to equal the charge for eight square feet of glass.

***I11-I12.* Pre-hung insulated door**: New paneled door to be pre-hung steel-clad or fiberglass with R-7 or better thermal rating (high density polyurethane insulation). Frame to be primed with solid wood with matching brick mold. Include peephole and lock reinforcement (12" wood lock block or suitable insert). Door is to be hung with three brass 4" butt hinges. Ensure that threshold has support to prevent deflection. to be installed at homeowner's preference. If installing two, lower to be mounted at ADA height, 42" from the floor. Doorknob and deadbolt to be keyed alike.

I14. Entry lockset & deadbolt: to be keyed alike.

MECHANICAL VENTILATION

J1. Bath Fan Variable Speed: New bath fan system including fan, ducting, duct sealing, duct insulation and termination cap. Panasonic models WhisperFit (FV-0511VF), WhisperGreen Select (FV-0211VK3), WhisperCeiling (FV-0511VQ1) or equivalent with prior approval. If the Whisper Green FV-0511VK3 model is installed, 6" duct and cap must be used; reducers are not permitted. Fan must be set to 50 CFM. Contractor shall test fan flow to verify settings. The associated switch must be clearly labeled “Whole House Fan.”

J3. Smart Switch Fan Timer, 1 Program w/ delay: Ventilation Fan Control Panasonic FV-WCPT1-W Fan/Light Control with Delay Timer or equivalent with prior approval. Timer to be set to 10min/hr. with 30-minute delay.

J4. Humidistat Switch: Timer to be set to 10 min/hr. and 50% humidity upon installation. Ventilation Fan Control Panasonic FV-WCCS1-W or equivalent with prior approval.

J5. Module In-Fan, Motion Sensor Boost: with Multi-Speed & Time Delay: Module compatible with Whisper Green Select model. Use toggle switch to control power at source. Multi-Speed Time Delay (FV-VS15VK1) AND Smart Action Motion Sensor (FV-MSVK1).

J7. Energy Recovery Ventilator: Install Panasonic WhisperComfort60 (FV-06VE1), or equivalent with prior approval. Cost for ceiling or in wall installations only. Construction of horizontal or vertical soffits require additional Time and Materials charge, if necessary.

- If intake and exhaust ducts are separate, intake should not be placed on roof. Only Soffit/Gable/Wall are acceptable intake locations, Screen but NO damper. May use FV-WC10VE1 Whisper Vent Wall Cap.
- Wired in "low mode" to provide the ability to adjust controls.
- Provide a labeled disconnect switch; if on solo circuit panel disconnect is acceptable, wall switch near unit if fan is sharing a circuit.
- JBox Controls must be accessible, if enclosed in soffit provide an access panel.
- Contractor to commission unit with 30 CFM intake air and 20 CFM exhaust air.

SAFETY

L1-L3. Safety: Detectors must be installed on the first day of project.

TIME AND MATERIALS

M1. Time and Materials: Vashon Island Ferry Charge (No more than 4 separate trips)**.** The work is anticipated to require no more than four (4) separate trips. Any trips in excess of four (4) shall require the prior written approval of the Construction Coordinator.