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Accessible

Water Conservation

Air Quality

Resource Conscious

Energy Efficient

AWARE Green/Universal Design Manual

Performance Standards for City of Columbus and Franklin County
Federally-Funded Residential Rehabilitation and Construction Projects

The AWARE Green/Universal Design Manual provides building standards and contractor requirements for all residential projects awarded federal funds through the City of Columbus and Franklin County. The green and universal design standards are applicable to both new construction and housing rehabilitation. The City and County are committed to promoting AWARE standards of construction throughout Columbus and Franklin County.

The AWARE Green/Universal Design Manual was designed to achieve Enterprise Green Communities Standards (<http://www.greencommunitiesonline.org/>). The City and County desires to reach the highest level of green and universal design standards possible within parameters of funding and feasibility of the project. Therefore, some standards are marked mandatory but may be waived due to special circumstances pertaining to the structure and the rest are optional.

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The Following are the Common Goals Task Reference Codes for the City of Columbus and Franklin County:

- (E) Energy Efficiency
- (G) Green
- (H) Healthy Homes
- (L) Lead Safe
- (P) Historic Preservation
- (U) Universal Design

Definitions:

New Build – New structure constructed on vacant lot.

Gut Rehab – Demolition and removal of all interior components down to bare stud walls and flooring.

Major Rehab – All projects with a rehab cost of twenty five thousand dollars, (\$25,000.00), or more. The cost of these projects will now require lead hazards to be abated.

Moderate Rehab – All projects with the rehab cost under twenty five thousand dollars, (\$25,000.00). These projects shall be done lead safe.

Double Conversion – Taking a double structure and converting it to a single family structure.

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Contractor Mandatory Requirements

To participate in the City of Columbus and Franklin County Residential Programs for Rehab and New Builds, the contractor must meet the following criteria:

- Contractor certifies that they have not been removed from the City of Columbus, Franklin County or State of Ohio contractor list in the past twelve (12) months.
- Contractor certifies that they have not been debarred from public contracts for any reason or found by the City of Columbus, Franklin County or State of Ohio (after all appeals) to have violated prevailing wage laws more than three times in a two-year period in the last seven years.
- Contractor certifies that they have not been penalized or debarred from any public contracts for falsified certified payroll records or any other violation of the Fair Labor Standards Act or for any other reason, in the last five (5) years.
- Contractor certifies that they have implemented an OSHA compliant Safety Program and will provide evidence of such upon request.
- Contractor certifies that they maintain a substance abuse policy for their personnel and will provide evidence thereof upon request.
- Contractor certifies that they do not have an Experience Modification rating of greater than 3.0 (a penalty-rated employer) with respect to the Bureau of Workers Compensation risk assessment rating.
- Contractor certifies they are compliant with unemployment and workers compensation laws.
- Contractor certifies that they will supply all required bonds, (License and/or Performance) bonds, to do business in the State of Ohio with an A.M. Best Company rating of at least A.
- Contractor certifies they will employ supervisory personnel with at least three (3) or more years experience in the specific trade on the projects.
- Contractor certifies that they or their sub-contractors have all the required licenses to obtain the permits and to do the work.

Bidding

Contractor must have the following in order to bid on the City of Columbus and Franklin County Residential Programs for Rehab and New Build projects:

- Current Home Improvement Contractors License, (HIC), issued by The City of Columbus for contractors working on 1 to 3 family residential units per building. A current General Contractors License is required on projects with 4 or more residential units per building.
- Current Liability Insurance with minimum of one million per occurrence and two million dollar aggregate.
- Current Workers Compensation Certificate
- Current Equal Business Opportunity (EBO) Certificate and Contract Compliance Number

Schedule

Contractor must supply a work schedule at the pre-construction meeting, indicating all stages of the work with project completion on or before the construction completion date in the contract.

Permits

Rehabilitation and New Construction:

- All the required permits are to be posted at the construction site at all times. Failure to do so will cause a shut down of the project until permits are posted.
- No invoices will be processed if applicable work has not been inspected, approved and signed off on the permit(s).

Timeliness

Project shall be finished within the time frame set in contract. There will be no time extension granted unless:

- Delay is weather related, for exterior work only.
- Delay is caused by an act of neglect by the owner/developer and/or by a city/county representative.
- Delay is caused by authorized changes in the work.
- Delay is caused by circumstances beyond the contractor's control.

Failure to complete project in timely manner may result in:

- Liquidated damages against the contractor.
- Removal of contractor from the project and from all City of Columbus and Franklin County federally funded housing programs.

Waiver of Liens

General Contractor – Shall submit with every invoice a lien waiver that they have paid in full all work performed and for all labor, materials, machinery, or fuel furnished by the original Contractor and all Subcontractors, material men and laborers.

Sub-Contractors – The general contractor shall supply with every invoice a lien waiver from every sub contractor that is connected to that invoice, that they have been paid in full for all the work they performed which covers all labor, materials, machinery, or fuel furnished by the original Contractor and all subcontractors, material men and laborers. The Contractor shall also submit a subcontractor monitoring data form supplied by the City of Columbus.

Change Orders

Any changes from the original specifications can be approved by the developer up to 10% of the project bid price via a written and signed change order. All changes after that must be approved by the developer and the City of Columbus or Franklin County via a written and signed change order.

Specifications

The burden of proof is on the contractor to show that all material, preparation, finishing and workmanship, are compliant with the projects specifications. If any items do not meet or exceed the specifications they will be corrected at the contractor's expense and no additional construction time will be granted. Project will stay on original time frame.

(G) (E) (H) (L) (P) (U)

Manuals & Warranties

Contractor is to provide a packet containing all manufacturer's manuals and warranties on all the installed equipment, fixtures and appliances, at the time of the Final Inspection. Any/All Pre-existing items are exempt. Final invoice will not be processed until packet is provided.

Disposal/Recycle

Contractor shall recycle all cardboard generated by construction and all cardboard trash in the house to the local recycling plant. Disposing of cardboard in any other manner will result in a \$500.00 penalty assessed on the contractor per each occurrence. The penalty will be deducted from the contractors next invoice draw.

Encourage the reuse/recycling of other construction and demolition wastes for which there are recycling opportunities locally available.

(G)

Mandatory Performance Standards, Testing and Inspections

Energy Efficiency and Testing

- **Standard:** The target Energy Efficiency performance is to meet or exceed the Energy Star requirement for the region. The current target score is a HERS Index of 85 or lower.
- **Testing:** Third Party Energy Efficiency Testing shall be done by an independent third party, Certified HERS Rater using the HERS Index scoring system. The HERS Index is a scoring system established by the Residential Energy Services Network (RESNET) in which a home built to the specifications of the HERS Reference Home (based on the 2006 International Energy Conservation Code) scores a HERS Index of 100, while a net zero energy home scores a HERS Index of 0. The lower a home's HERS Index, the more energy efficient it is in comparison to the HERS Reference Home.

Air Tightness and Testing

- **Standard:** Air tightness of building enclosure (envelope) – 0.25 cfm50 per sq. ft. of building enclosure (measured at 50 Pascals (Pa)).
- **Testing:** Before a project is finalized, the house shall under go a blower door test by an independent third party to verify that the air tightness of the building enclosure (envelope) meets the current standards
- **Standard:** No air leakage of joints, collars, flex duct connections and seams in ductwork
- **Standard:** Air Conditioning Contractors of America (ACCA) 8th Edition of their Manual J Heat loss calculation tool <http://www.acca.org/tech/manualj/> (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection.
- **Testing:** Provide both Manual J & S reports with first Draw documents.
- **Testing:** Third Party testing of furnace and ductwork performance.

Lead Safe and Lead Paint Visual Testing

- **Standard:** All visible dust, paint chips and any other paint-related debris have been cleared from the site after interior demolition is complete in Gut Rehab
- **Testing:** A visual inspection shall be conducted after interior demolition is complete in Gut Rehab to verify all visible dust, paint chips and any other paint-related debris have been cleared from the site. The site must be cleared before any rehab work can begin.
 - The inspection shall be done using a certified inspector who has successfully completed the U.S. Department of Housing and Urban Development, Office of Healthy Homes and Lead Hazard Controls.
 - The visual assessment certificate can be obtained online.

Lead Safe and Lead Paint Clearance Testing

- **Standard:** Pass State of Ohio's lead paint clearance test
- **Testing:** A third party, State of Ohio licensed Risk Assessor will conduct the State of Ohio's lead paint clearance test on all homes built prior to 1978, whether a gut rehab, moderate or major rehab, before the final invoice can be processed. (H) (L)

Inspecting Energy Related Features

All homes shall have an on-site inspection by the Developer's Construction Manager to verify the installation of energy-related features such as:

- Duct installation and sealing.
- Building envelope air sealing details *prior* to installation of insulation
- Proper installation of insulation, including no gaps, voids, or compressions.
- Insulation accurately fits cavity
- Windows and doors are to be flashed, caulked, and sealed properly.

Inspecting Framing and Utilities: Contractor Photos

The contractors shall have a photo record of framing with the utilities installed. The photos are to be taken before installing insulation and to be clearly and accurately marked as to each wall.

Inspecting Pre-Drywall

All homes shall have a pre-drywall insulation inspection by the Developer's Construction Manager to verify proper installation of insulation.

Sign-off on all required permit inspections

Mandatory Design Standards

Accessibility/Universal Design Standards

Mandatory: At least 20% of all Federally Funded Projects are to meet all Universal Design Accessibility Standards. (New Build, Double Conversions and Possible Gut Rehabs)

- 1 to 5 houses = 1 house
- 6 to 10 houses = 2 houses
- 11 to 15 houses = 3 houses

Intent Beyond Mandatory: The City of Columbus and Franklin County's intent is to incorporate as many of the Universal Design Accessibility Standards in all Federally Funded residential projects including but not limited to:

- An accessible half bathroom on the first floor
- Wood blocking installed in the walls
- Zero-step entry
- Exterior and interior door openings and handles
- Location of windows, electrical outlets and switches
- Floor space/turning radius

Details of these and other items are located below and/or under the appropriate item throughout the AWARE manual

(U)

Entry Door Using Visit-Ability/Accessibility Route

Provide a covered entry at exterior door to prevent water intrusion and subsequent rotting of joists, sills, and finishes. (Reference page # 22 on doors.)

(U)

Interior Hallways

(New Build, Double Conversions and Gut Rehab If Possible)

Minimum net clear width shall be 36".

(U)

Interior Doorways

(New Build, Double Conversions and Gut Rehab If Possible)

All interior entry and walk-in closet doors shall have a minimum clear opening of 32" (preferably the door should have swing clear off-set door hinges).

(U)

First Floor Bedroom and Full Bathroom

(New Build, Double Conversions and Gut Rehabs If Possible)

Plans shall include the construction of a first floor bedroom and a full bathroom. However, when a first floor bedroom and full bathroom are not possible due to limited square footage conditions, build a half bath with at least a 5' X 5' free/clear floor area. If the 5' X 5' area is not possible, then construct a standard operational half bathroom.

(U)

First Floor Half Bath

(All Projects Without A First Floor Full Bath, Except Moderate Rehab)

Construct a half bath with at least a 5' X 5' free/clear floor area. If the 5' X 5' area is not possible, then construct a standard operational half bathroom.

(U)

Wood Blocking

(New Build, Gut Rehab and Major/Moderate Rehab If Walls Are Opened/Accessible)

- Bathtub/Shower/Commode Area: use either ¾" plywood installed on the entire wall or install standard blocking.
- Stairway: on stairway wall to 2nd floor install standard wood blocking at a height of 34" to 36" to reinforce handrail.

(U)

Laundry Room

(New Build, Double Conversions and Gut Rehab If Possible)

Construct a complete laundry room on a habitable floor level where square footage will allow.

(U)

Main Electric Service Box

Main electric service box shall be installed on first floor if possible.

(U)

Kitchen Floor Space

(New Build, Double Conversions and Gut Rehab If Possible)

- There must be a 30" X 48" clear floor space at each fixture and appliance. Not required at sink if base cabinet front is removable.
- Must have a clear floor space adjoining accessible route into the kitchen.
- Must have a 40" minimum clearance between all counters, base cabinets, appliances and walls.
- A 5' diameter turning circle is required in a U-shaped kitchen.

(U)

Second Floor Stair System

(New Build, Double Conversions and Gut Rehab If Possible)

Width of stairways are to be between 42" to 48" to accommodate a future chair lift installation.

(U)

Windows

(New Build and Gut Rehab)

Install with the window sill being a minimum height of 24" and a maximum height of 30" from the finished floor. Having the lower sills makes use easier for both children and older adults ; lower windows make it easier to look out thereby providing increased mental health.

(U)

Mandatory Developer Project Design Standards

Developer Team for New Build, Double Conversions and Gut Rehab

Each Developer shall put in place a team consisting of a Designer and/or Specification Writer and Construction Manager for each project that demonstrates capacity to complete the project with the City/County requirements.

Environmental and Historic Preservation

All projects shall submit an environmental and historic review form and comply with any restrictions that come about from the review.

(P)

Plans

(New Build, Gut Rehab and Double Conversions)

Create an efficient floor plan that maximizes open space while maintaining the home's functionality and to be designed for an additional 1st floor bedroom with full bathroom if square footage will allow. Otherwise, install a half bathroom only on the 1st floor.

Consider design of the kitchen/laundry area for space to accommodate recycling containers and compost bins.

(G) (U)

Framing Techniques and Plans

The use of a detailed framing plan reduces material waste wood without compromising the structural integrity.

Create a framing order waste factor limit. Limit the overall estimated waste factor to 10% or less.

(G)

Exterior Walls: Advanced Framing

(New Build Only)

Use 2" X 6" studs set at 24" on center with 2-stud corners and drywall clips at corners. If using the 2" X 6" studs interferes with the universal design intent, install 2" X 4" studs set 16" on center with 2-stud corners and drywall clips. The exterior walls of both shall be insulated to R-19.

(The use of wood blocking in place of drywall clips is acceptable as long as blocking is parallel to stud to which it is attached.)

(E) (G)

Material

(If Locally Available)

- Use pre-cut or pre-assembled building systems or methods.
 - Use building materials that require no additional resources to complete application onsite.
 - Use recycled-content building materials.
 - Use materials from renewable resources or agricultural byproducts.
- (G)

Material Protection and Moisture Prevention

Protect unused moisture-sensitive materials from water damage through just-in-time delivery, storing unused materials in a dry area, or tenting materials and storing on a raised platform.

Maintain moisture content of materials to industry standards.

(G) (H)

Integrated Pest Management

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 to prevent access by pests. Use Stuff-it copper mesh by Do it Your-Self Pest 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, in wall cavities, cracks and crevices in the kitchen.

(H)

Skylights/Day-Light Tubes

(Optional)

The use of skylights and tubular day-lighting devices are encouraged to be used if site/location is feasible to do so.

(Note: The ratio of skylight glazing to conditioned floor area may not exceed 3%. All skylights must meet the performance requirements for skylights.)

(G) (E)

Security System

Wireless System – Install the least complicated, unmonitored system.

Materials and Methods Standards

Adhesives, Low/No VOC

(Mandatory – All Projects)

All adhesives used shall comply with the following:

The volatile organic compound (VOC) content of adhesives, adhesive bonding primers or adhesive primers in this project shall not exceed the limits defined in Rule 1168 – “Adhesive and Sealant Applications,” amended 1 January 2005): South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov.

Air Intake

(Mandatory – All Projects)

Fresh Air Intake (Choose one of the following three systems)

- **Active/Forced Air System** Install a Ventilation Control System with temperature and humidity shut-offs 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.
- **Active/Forced Air System** Install a 6" 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 exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents.
- **Passive Fresh Air Intake** Install a passive intake vent, installed through the specified exterior wall, flashed to be weather-tight, and sealed to the building envelope's air barrier and interior & 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 exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents.

Return Air Transfer Grill

In absence of cold air returns in the bedrooms, install a Return Air Pathway, 12" X 6" or 12" X 12", Sound and Light restricted by-pass grill to balance forced-air system. Install in specified room and common space to provide return air. Seal to wall finish and install flange trim.

(G) (E) (H)

Ceiling Fan or Combo Fan/Light Bathroom Fixture

All with a minimum 80 CFM fan. Vented to the exterior with 4" galvanized metal duct work, seal as furnace ducts. Unit shall have a sound level of 0 – 3.0 sones.

Install either of the following:

- Energy Star rated, continuous run fan with a motion activated boost.
- Energy Star rated, continuous run fan with a switch activated boost.

(E) (G) (H)

Appliances, Kitchen

(Mandatory – All Projects)

Any/All kitchen appliances installed shall be Energy Star rated. All refrigerators shall be side by side refrigerator/freezer, with loop style handles.

Dryer Vent

Install 4" ridged metal vent tubing from the specified dryer location to a 4" wall mounted dryer vent hood with a back-flow preventer and NO screening. Do not fasten with nails, screws or other fasteners that protrude into the interior of the exhaust duct. Seal all seams in the system with duct mastic or aluminum foil tape, not duct tape. Secure duct and hood to framing.

(H)

Dehumidifier

Install an Energy Star rated, (50 pint minimum), dehumidifier in the basement. Install a drain hose from the dehumidifier to the floor drain to eliminate the need to empty the water storage tank.

(G) (H)

Kitchen Range Hood

(New Build and Gut Rehab Only and Only If Under Cabinet Microwave Not Being Installed)

Install an Energy Star rated, exterior ducted, enameled range hood with integral minimum 2 speed fan control and light switched separately capable of a minimum 150 cfm at a maximum of 10 sones. Attach hood to cabinet with screws. Include metal vent, to the exterior, with all seams sealed with duct mastic, and roof or wall cap/damper assembly flashed appropriately for the exterior finish. Developer's choice of color.

(G) (H)

Under Cabinet Microwave

(New Build and Gut Rehab Only and Only If Range Hood Not Being Installed)

Install an Energy Star rated under cabinet microwave. Include metal vent, to the exterior, with all seams sealed with duct mastic, and roof or wall cap/damper assembly flashed appropriately for the exterior finish. Developer's choice of color.

(E)

NOTE: If there is an old refrigerator left on site, the refrigerant must be reclaimed and door must be removed before discarding the appliance, or it can be picked up by an authorized dealer who will do so.

Basement

(Mandatory)

Concrete Slab

(New Build Only)

Install a continuous 4" thick basement slab using 3,000 psi mix. Ensure the soil is uniformly and properly compacted. Install a 4" bed of ¾" clean (no fines) gravel on top of soil, provide expansion joints (also known as isolation joints) around the inside perimeter of the foundation using standard isolation joint material, and install a continuous, over lapped at junctions, 6 mil polyethylene plastic vapor barrier between the stone and the concrete.

Include plastic reinforcing fibers in the mix, like fibermesh. 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.

(G) (H)

Foundation

(New Build Only)

Install foundation waterproofing and insulation.

Install a foundation drainage system with sump pump.

(G) (H)

Radon: New Build

(NOTE: Only an Ohio licensed mitigator can test and treat a home for radon gas.)

Install 6 mil polyethylene plastic sheeting under the slab to help prevent radon and soil gas from entering the house. In crawl spaces, place plastic over the crawl space floor, taping all overlaps and at foundation walls. Before pouring the slab install a 4" PVC pipe into the gas layer. This pipe shall run through the house to the roof to safely vent radon and soil gases. Provide an electrical junction box at the pipe area in case an electric venting fan must be added. All openings in the concrete foundation floor are to be sealed/caulked to reduce soil gas from entering the house. Install a fan to convert this passive RRNC system into an active system if a radon test shows elevated levels of radon gas in the house after construction.

(G) (H)

Radon: Rehab

(NOTE: Only an Ohio licensed mitigator can test and treat a home for radon gas.)

After house has been air-sealed, test for radon gas and if test shows elevated levels then install an active system to vent radon and soil gases.

(G) (H)

Floor Drains

Install back water valves in basement floor drain.

Cabinets & Countertops

(Mandatory – All New and Replacement Installation)

- **All door and drawer pulls shall be a loop or U shaped handle style placed as low as possible on wall cabinets and as high as possible on base cabinets.**
- **All base cabinet fronts at sink area must be of the removable style/design.**
- **All base cabinets shall have a toe kick of 9 inch high and 6 inch deep.**

(U)

Countertop

After field measure for sizing, install a Plastic Laminate or an approved equal or better compliant countertop at the standard height of 36". Seal all bare wood and wood composite surfaces including the underside of the countertop with a low VOC sealant. Screw to base cabinet a square edged plastic laminate counter top. Provide end-caps and cutout for sink. Caulk countertop to adjoining walls with low VOC caulking to match wall color. Developer's choice of in-stock color and texture.

(G) (H)

Base, Wood Cabinet

Install base cabinets constructed of solid hardwood face-frames, doors and drawer fronts with ½" wood/plywood carcasses and floors. Drawer boxes shall be wood or plywood, and joined using wood, metal or plastic corner bracing. Use cabinets that are Environmentally Certified under Kitchen Cabinet Manufacturers Association's (KCMA) Environmental Stewardship Program (ESP). Cabinets shall be of a height to accommodate the countertop height of 36" and to include a pull out workspace, such as a pull out cutting board.

(G) (H) (U)

Base, Low VOC, Wood Cabinet

Install base cabinets constructed of solid hardwood face-frames, doors and drawer fronts. Drawer boxes shall be wood or plywood. Carcasses will be joined using wood, metal or plastic corner bracing. All particleboard components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard shall be sealed with a clear low-VOC sealant or have a factory-applied sealant prior to installation. All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a clear low-VOC sealant or have a factory-applied low-VOC sealant prior to installation.

Cabinets shall be of a height to accommodate the countertop height of 36" and have a pull out workspace, such as a pull out cutting board.

(G) (H) (U)

Base Cabinet Shelves

(Suggested)

Install base cabinets with the lower shelves that pull out like drawers.

Wall, Wood Cabinet

Install wall cabinets constructed of solid hardwood face-frames, doors and drawer fronts with ½" wood/plywood carcasses and floors. Carcasses will be joined using wood, metal or plastic corner bracing. Use cabinets that are Environmentally Certified under Kitchen Cabinet Manufacturers Association's (KCMA) Environmental Stewardship Program (ESP).

(G) (H)

Wall, Low VOC, Wood Cabinet

Install wall cabinets constructed of solid hardwood face-frames, doors and drawer fronts. Drawer boxes shall be wood/plywood. Carcasses will be joined using wood, metal or plastic corner bracing. All particle-board components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard shall be sealed with a clear low-VOC sealant or have a factory-applied sealant prior to installation. All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a clear low-VOC sealant or have a factory-applied low-VOC sealant prior to installation.

(G) (H)

Doors, Exterior

(Mandatory – All New and Replacement Installation)

Metal

Install Energy Star rated steel insulated door, such as Jeld-Wen Premium Superior door or an approved equal or better door. Complete with lockset and deadbolt lockset. All locksets and deadbolt locks shall be keyed alike. The door must also include a peep hole. The threshold is to be no higher than ½" if the entry is at the visit-ability/accessibility route. All doors, front/rear/side, shall be 36" wide. All locksets to be lever handle style.

(E) (G) (P) (U)

Wood

Install Energy Star rated wood door, complete with lockset and deadbolt lockset. All locksets and deadbolt locks shall be keyed alike. The door must also include a peep hole. The threshold is to be no higher than ½" if the entry is at the visit-ability/accessibility route. All doors, front/rear/side, shall be 36" wide. All locksets to be lever handle style.

(E) (G) (P) (U)

Glass Sliding Door

Install only glass doors that have NFRC ratings that meet or exceed the requirements of the Energy Star rating.

(E) (G)

French Doors

Install Energy Star rated French Doors in lieu of sliding doors if the doorway is at a visit-ability route. Threshold shall be no higher than ½ inch.

Existing Garage

Overhead Door - All garages shall have an automatic garage door opener with two remote controllers.

(U)

Flashings

Effective flashings must be used on all rough openings, including membrane flashing on bottom of all rough openings for windows, (pan flashing with back dam), and doors using adhesives compatible with drainage plane materials. Also install window and door jamb and head flashing that integrates with drainage plane.

(E) (G)

Doors, Interior

(Mandatory – All New and Replacement Installation)

Composite

Install green-friendly interior doors. Complete with passage lever handle-latch set and use a privacy set on the bathroom(s) and bedroom(s). Preferably all doors should have swing clear off-set door hinges.

(G) (U)

Electric, Service

(Mandatory – All New and Replacement Installation)

Main Service Box

Install a 200 amp 3 wire service complete with breaker type panel box with all circuits labeled and balanced. Leave provision for at least 4 additional circuits. Provide separate appliance circuits in kitchen. New service is to have arc fault breakers, per local code. To include new exterior meter panel. Service box shall be installed on first floor if possible.

(U)

Electric, Fixtures

(Mandatory – All New and Replacement Installation)

Smoke Alarms

Install one interconnected, hard-wired smoke detector with battery back-up in each sleeping room, outside each separate sleeping area in the immediate area of the bedrooms and on each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics.

EXCEPTION:

Smoke alarms in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal or opening-up of interior wall or ceiling exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes.

(G) (H)

Carbon Monoxide Detectors

Install one on each floor area and basement, all to be hardwired and inter-connected.

EXCEPTION:

Carbon monoxide detectors in existing areas shall not be required to be interconnected and hard wired where the alterations or repairs do not result in the removal or opening-up of interior wall or ceiling exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring and interconnection without the removal of interior finishes.

(G) (H)

Interior Ceiling Light

Install an Energy Star rated florescent ceiling light fixture.

(E) (G)

Interior Wall Light

Install an Energy Star rated fluorescent wall fixture.

(E) (G)

Kitchen Ceiling Light

Install an Energy Star rated florescent ceiling light fixture.

(E) (G)

Basement Light

Install fluorescent or CFL lighting.

Exterior Light

Install a two lamp halogen, dusk to dawn light fixture with motion activated higher light level function.

(A) (E) (G)

Bathroom Ceiling Fan

A minimum of one bathroom shall have an Energy Star rated continuous low running two stage bathroom fan or fan/light combo fixture with a sound level from 0 – 2.0 sones, with an adjustable time delay switch, and a minimum of 80 CFM fan when switch is on. Install 4" ridged metal vent tubing to a 4' wall mounted vent hood with a back-flow preventer. Seal all seams in the system with duct mastic or aluminum foil backed tape, not duct tape.

(E) (G) (H)

Ceiling Exhaust Fan

In all other full and half bathrooms, install an Energy Star rated exhaust fan or fan/light combo fixture with a sound level of 0 – 2.0 sones with a humidistat sensor switch, and a minimum of 80 CFM fan. Vent outside to a 4" wall mounted vent hood with a back-flow preventer.

(E) (G) (H)

Ceiling Fan With or Without Light Fixture

Install one Energy Star rated ceiling fan with three (3) speed setting, in all the living/family rooms and one in each bedroom. Length of fan blade is to accommodate the room square footage. (If fan has light fixture, use CFL bulbs only, in the fixture)

(E) (G)

Ceiling Fan Switch

Use slide-to-off. Single pole, 3-speed fan control with light switch. Installed no higher than 42" from the finished floor.

(U)

Wall Outlet

Install with the bottom outlet at least 18" above the finished floor line.

(U)

Wall Light Switch

Install with the switch itself being no higher than 42" from the finished floor. Must use large rocker or touch-sensitive lighted switch instead of toggle switch.

(U)

NOTE – If an outlet or switch is obstructed by a base cabinet or countertop, then the maximum height for the switch or outlet shall be 46" above finished floor.

Phone Jack

(New Build and Gut Rehab Only)

Prior to air sealing of the structure, install a plaster ring and phone jack, no lower than 18" above the finished floor line, wired to the phone service. Stapled, surface-mounted wire is not acceptable unless prior written approval is given by the Construction Manager.

(U)

Cable Connection

(New Build and Gut Rehab Only)

Prior to air sealing of the structure, install a cable TV circuit with a connector no lower than 18" above the finished floor line. Run from the point of service delivery to a wall jack with a cover plate sized for the coaxial cable and a minimum of 5' of cable available outside of the wall jack. Use coaxial cable and connectors approved by the cable service provider for TV system. Exposed and stapled installations of cable are prohibited without the prior written approval of the Construction Manager.

(U)

Floor Coverings

(Mandatory – All Projects)

Owner/Developer to choose all brands, colors, finishes and etc.

All adhesives used shall be no/low VOC products

All floor tile, sheetgoods and wood flooring in the kitchen must be extended under the base cabinet at the sink area because it shall have a removable front.

All bathrooms shall have non-slip green compliant flooring.

(U)

Floor Tile

An approved green compliant tile.

(G) (H) (U)

Sheetgoods

Linoleum or an equal or better green compliant material.

(G) (H) (U)

Wood Flooring

An approved green compliant/certified wood flooring.

(G) (H) (U)

NOTE: At all entryway floor areas at the exterior doors, must be covered with water-resistant flooring; no carpet. The dimensions shall be a minimum of a 4' X 4' area.

(U)

NOTE : Developers are encouraged not to use carpeting, which can be a harbinger for dust, allergens and other substances that may pose health hazards to susceptible residents. We recommend developers use alternative flooring material such as linoleum, laminate, ceramic tile, bamboo, cork, wood or rubber.

(H)

Carpet With Padding

(If Installing Carpet)

Install FHA approved carpet. Install over 1/2" medium density pad with a minimum of seams. Carpet and pad *must meet the Carpet and Rug Institutes Green Label certification*. Stretch carpet to eliminate puckers, scallops and ripples. Include tackles strips, metal edge strips and mending tape. Carpet is to cover the entire floor including any closets in the room.

(No carpet in kitchen and bathrooms.)

(G) (H)

HVAC

(Mandatory – All New and Replacement Installation)

Note # 1:

Size heating and cooling equipment in accordance with the Air Conditioning Contractors of America (ACCA) Manual, Parts J and S, ASHRAE handbooks, or an equivalent software, to prevent short-cycling of heating or air conditioning and ensure adequate dehumidification. Contractor is to supply copy of their calculation report. Installation of an improper size furnace and or air conditioner will be replaced by the contractor, at their expense.

Note # 2:

HVAC contractor shall perform/verify the following:

- Start-up procedure according to manufactures instructions.
- Refrigerant charge verified by super-heat and/or sub-cooling method.
- Burner set to fire at nameplate input.
- Air handler setting/fan speed.
- Total airflow within 10% of design flow.
- Total external system static should not exceed equipment capability at rated flow.

Note # 3:

“NO HVAC DURING CONSTRUCTION” – Mask off all HVAC outlets during construction. Avoid any use of the HVAC equipment during construction if at all possible. Otherwise, have all HVAC ducts and coils cleaned by a professional company at the time of completion on the project.

(G) (H)

Natural Gas Furnace

Use the Air Conditioning Contractors of America (ACCA) 8th Edition of their Manual J Heat loss calculation tool, <http://www.acca.org/tech/manualj>, and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J and S reports with first Draw documents. Size furnace to the living unit considering any areas which may be added or subtracted from the plan.

Remove existing furnace & dispose of in legal dump. FURNACE: install a 90+ gas fired forced air furnace with minimum AFUE rating of 90% on 2" patio block to existing duct work & gas line. New furnace to be vented with PVC piping per manufacturer's specifications. New furnace will have minimum limited warranty of: 20 years on the heat exchanger and 5 years on parts. Include auto set back thermostat control, vent pipe and new shut-off valve. Rework cold air return if necessary to ensure easy access, good fit & easy replacement of air filter. An exterior return air filter box shall be installed on one side, both sides, or bottom of new furnace. Seal all exposed duct joints as a part of this item with Duct Mastic.

(E) (G)

Upon completion of the project and after the ducts and furnace has been cleaned, install a new furnace filter and leave one extra for future homeowner use. Use Nature Air, 3M-Filtrete or any other brand of filter that has at least a MERV 11 rating.

Air Conditioner

Install an Energy Star, minimum 13 SEER rated air conditioner (SEER, the Seasonal Energy Efficiency Ratio, measures energy efficiency), the higher the SEER, the greater the level of efficiency. Sizing and proper installation are critical to the energy efficiency and home comfort, so it is important to hire a qualified technician.

(Air Conditioner shall use Puron instead of Freon)

(E) (G) (H)

Thermostat

Install a 7 day Energy Star rated, programmable thermostat with large readable digital numbers.

(Install with the top of the control no higher than 48" from the floor.)

(E) (G) (U)

Duct Work

(Size to manual D)

- Install all duct work, cold air returns and floor/wall registers to code. Seal all joints, collars, flex duct, connections and seams in duct work and plenums with fiberglass mesh and a 1/16" coating of duct mastic.
- Do not install ducts in exterior walls unless extra insulation is added to maintain the overall UA for exterior wall without ducts.
- In standard rehab project, use at least R-6 insulation around ducts in unconditioned spaces .
- In new construction and gut rehabs, all ductwork shall be contained within insulated envelope to prevent conditioned air loss in unconditioned areas.
- Ducts in interior wall cavities must be fully ducted (i.e., do not use the wall cavity as a heating duct or a cool air return).

(E) (G)

NOTE: If an old air conditioner is on site the refrigerant must be reclaimed before discarding the unit or have it picked up by an authorized dealer to do so.

Insulation & Air Sealing Structure, Air Seal

(Mandatory – All Projects)

Air Seal Structure

Seal all accessible cracks, gaps and holes in the building envelope (the barrier between the indoor conditioned space and the outside) with either low VOC caulk if less than ¼" wide or expanding foam if greater than ¼" wide. 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 large accessible gaps around windows between house framing and window frame – use special care on large sliding-glass doors and vinyl-framed windows: do not use expansive foam on these. 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 that is securely fastened to framing sealing all seams and gaps with fire rated caulk. Seal recessed light fixtures in ceilings that are part of the building envelope and are not rated for insulation contact with an airtight box made of drywall sealed to the ceiling and seal IC rated recessed fixtures with caulk. Seal any entries to attic space using weather stripping on attic doors or hatches. Air sealing must be done and inspected by construction manager *prior* to the installation of insulation.

(E) (G)

Attached Garages

- Install an Energy Star rated, continuous low-running two-stage motion-activated fan ventilation system to exhaust garage air to the outside.
- Ensure a tightly-sealed door between the garage and living area. Also, provide continuous air barrier between garage and living areas including air seal penetrations at walls, ceiling, and floors.

(G) (H)

Crawl Space Air Seal and Insulation

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 caulking rated to adhere plastic. Overlap seams in the plastic by 2 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. After the plastic vapor barrier has been inspected and approved by the on-site construction manager and the City of Columbus or Franklin County housing rehabilitation specialist responsible for this property, install a minimum R13 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.

(E) (G)

Insulation & Air Sealing Structure, Insulation

(Mandatory – All Projects)

Insulation Performance Standards and Testing

- Standard: Rim Joists will achieve R-19 minimum
- Testing: Third Party inspection of materials and workmanship prior to covering
- Standard: Exterior Wall System will achieve R-19 minimum
- Testing: Third Party inspection of materials and workmanship prior to covering
- Standard: Attic will achieve R-38 minimum
- Testing: Third Party inspection of materials and workmanship prior to covering

Water Lines

Insulate all exposed and accessible hot and cold water lines with closed cell polyethylene slip on pipe insulation, sized to fit pipe diameter. Seal seams with 5 mil pipe insulation sealing tape or closure clips designed for pipe insulation placed every 4". Seal all butt joints between sections of pipe with 5 mil pipe insulation sealing tape. Neatly miter all angled junctions.

(E) (G)

Spray Foam for Rim/Band Joist Areas (to R-19 minimum)

After cleaning the area thoroughly, apply Green Compliant, expanding foam to the rim joist at the entire perimeter of the basement and/or crawl space exterior walls. Install to R 19 at a minimum. Use a foam product that meets International Residential Code (IRC), Section R314.5.11, and Underwriters Laboratories, Inc. (UL) classification Certificate R7813. 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.

(E) (G)

Lumber & Wood Alternatives

Note: Recycled Products, FSC- Certified Products, Reclaimed and Composite products with no added urea-formaldehyde resins are preferred.

(G)

Building Material

- Use pre-cut or pre-assembled building systems or methods.
- Use building materials that require no additional resources to complete application onsite.
- Use recycled-content building materials.
- Use materials from renewable resources or agricultural byproducts.

(G)

Oriented Strand Board (OSB)

(Mandatory – All Projects)

Use as an alternative to plywood for sheathing, flooring and roofing.

(G)

Wood I-Beam

(Mandatory – New Build)

Use wood I-Beams as an alternative to 2 X 6's or 2 X 8's used for floor and roof joists.

(G)

Laminated Wood Fiber Products

(Mandatory – New Build)

Gluelam, parlam, microlam, etc. are alternatives to large dimension lumber for trusses, beams and headers.

(G)

Certified Wood

(Mandatory – If Locally Available)

Certified wood is used like conventional lumber for framing. This wood is certified by the Forest Stewardship Council that it has been monitored from forest to local supplier to insure that wood is harvested, milled, and delivered under environmentally, and socially responsible conditions.

Look for the FSC-stamp for confirmation that the wood complies with the certification requirements set out by the Council.

(G)

Plastic Lumber

This is made from recycled plastic products. It can be used as an alternative to wood in non-structural applications such as decking and fencing.

(G)

Paints & Finishes

(Mandatory – All Projects)

Same standards as for the interior and exterior.

Application

- All paints and finishes shall meet the Green Seal Standard GS-11.
- All colors/finishes shall be selected by owner/developer.
- Application shall be one coat primer and two coats of finish.
- Doors shall be finished on all six sides.

Caulking

All caulking shall be a 25-year or better, paintable low VOC caulk.

(G) (H)

Plumbing, Bathroom

(Mandatory – All Projects)

Note: All water lines in gut rehab and new builds are to be run inside an insulated conditioned/envelope space.

(G) (E)

Commode (ADA Compliant)

Install a 1.3 GPF close coupled, white, vitreous china commode such as the American Standard FloWise Compact cadet 3EL 2403.128, or any commode tested through the latest “Maximum Performance” (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. 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 November 2008 report <http://www.allianceforwaterefficiency.org/MaP-main.aspx>. Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shut-off valve, and wax seal.

(New Build and Gut Rehab Only, Unless Moderate/Major Rehab Will Allow)

Commode, on-center, is to have 18" clearance to center of commode on one side (for possible installation of grab bar) and at least 36" to center of commode the other side (to facilitate wheelchair transfer and access).

(G) (U)

Dual Flush Commode (ADA Compliant)

Install a “Dual Flush,” 2 piece, close coupled, white, vitreous china commode with flow rates of 1.6 and .9 GPF for its respective high and low flushes, such as the TOTO Aquia CST41M Elongated Front, Dual Flush commode Toilet Kit, or any commode tested through the latest “Maximum Performance” (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. 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 November 2008 report. <http://www.allianceforwaterefficiency.org/MaP-main.aspx> Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shut-off valve, and wax seal.

(New Build and Gut Rehab Only, Unless Moderate/Major Rehab Will Allow)

Commode, on-center, is to have 18" clearance to center of commode on one side (for possible installation of grab bar) and at least 36" to center of commode the other side (to facilitate wheelchair transfer and access).

(G) (U)

Lavatory Single Lever Handle Faucet

Install washer-less, all metal faucet with drain pop-up lever, with a maximum flow rate of 2.0 GPM. Installation shall include supply lines and shut off valves.

(E) (G) (U)

Lavatory Dual Lever Handle Faucet

Install all metal, faucet with drain pop-up lever, with a maximum flow rate of 2.0 GPM. Installation shall include supply lines and shut off valves.

(E) (G) (U)

Shower/Water Control

(Recommended)

Place water controls off to the side instead of under the showerhead, as this permits easy on/off and temperature adjustments without the risk of getting soaked or scalded.

(U)

Bathtub/Shower Unit (Complete)

Install new tub and surround, (as green compliant as possible). Install a lever operated pop-up drain and overflow, all drain pipes, shower rod, a single lever shower diverter tub/shower faucet or an approved equal with an anti-scald device and a hand-held adjustable height showerhead with a maximum 2.0 GPM flow rate.

Shower controls shall be no higher than 48" or lower than 18" from the tub/shower floor.

All tubs shall have non-slip bottoms and a wide flat edge that can be sat on when entering and exiting the bathtub.

(E) (G) (U)

(Note: Use highly durable, moisture-resistant materials in tub/shower enclosures such as cement board and fiberglass-reinforced board. Green Board is not permitted.)

(G) (H)

Separate Shower Area and Surrounds

The shower is to have a low step-up entry and with a floor area of minimum 5 ft x 3 ft, with 5 ft X 4 ft preferred. Shower control to be no higher than 48" from floor. Shower-head shall be an adjustable height spray hand-held model with a maximum 2.0 GPM flow rate. The walls are to be finished with ceramic tiles. All controls shall be single lever style and with an anti-scald device. Tub design to have a wide, flat edge that can be sat on when entering and exiting the tub.

All shower floors shall be of a non-slip material.

(E) (G) (U)

(Note: Use highly durable, moisture-resistant materials in all tub/shower enclosures such as cement board and fiberglass-reinforced board. (Green Board is not permitted.)

(E) (G) (H)

Bathroom Sinks

(Developer to Choose)

- Install wall mounted sink. Counter surface is to be no higher than 36" above finished floor. Provide a clearance of at least 29" above the finished floor to the bottom.
- Install pedestal sink.
- Install cantilevered sink, with the top being no higher than a 36" above the finished floor, with a removable cabinet underneath.
- Install a 24" or wider, plywood vanity with cultured marble integrated top, (no higher than 36"), bowl and backsplash and single lever brass bodied faucet with a maximum 2.0 GPM flow rate. Include PVC DWV with Air Admittance Valve, type L copper with brass bodied stops or PEX supply piping, and escutcheon plates on all supply and waste lines.
(U)

Medicine Cabinet

The medicine cabinet shall have at least one usable shelf no higher than 44" above the finished floor.

(U)

Wall Mirror

The mirror shall be mounted with the bottom edge of the reflecting surface no higher than 40" above the finished floor.

(U)

Plumbing, Kitchen

(Mandatory – All Projects)

Note: All water lines in gut rehab and new builds are to be run inside an insulated conditioned/envelope space.

(G) (E)

Single Bowl Sink

Install a 22 gauge, 25" X 22" X 8" deep, single bowl, stainless steel, self rimming kitchen sink including a steel, metal body faucet rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves and escutcheon plates on all supply and drain lines. NOTE: All copper is to be soldered (no compression fittings) and all PVC fittings glued. No exceptions.

Double Bowl Sink

Install a 22 gauge 33" X 22" X 8" double bowl, stainless steel, self rimming kitchen sink including a steel, metal body faucet, rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves and escutcheon plates on all supply and drain lines. NOTE: All copper is to be soldered (no compression fittings) & all PVC fittings glued. No exceptions.

Single Lever Handle Faucet, w/Sprayer

Install washer-less, all metal faucet with a maximum flow rate of 2.0 GPM. If using a faucet with a higher rate than 2.0 GPM, it must be retro-fitted with a different aerator to accommodate the 2.0 GPM or less standard. Installation shall include supply lines and shut off valves.

(E) (G) (U)

Dual Lever Handle Faucet, w/Sprayer

Install all metal faucet with a maximum flow rate of 2.0 GPM. If using a faucet with a higher rate than 2.0 GPM, It must be retro-fitted with a different aerator to accommodate the 2.0 GPM or less standard. Installation shall include supply lines and shut off valves.

(E) (G) (U)

Garbage Disposal

Install an Energy Star rated disposal with a minimum of ½ hp rating.

(E) (G) (H)

Water Filter

(Suggested Only)

The use of a high quality water filtering system is healthier and eliminates the need to buy bottled water.

(H)

Roofing

(Mandatory – All Projects)

Sheathing

All sheathing shall be OSB board.

(G)

NOTE: The use of light color shingles is encouraged because of its reflectivity of the sun, thus lowering the roof temperature.

Metal Roofing

Install, repair/replace sheathing. Use 7/16" OSB sheathing. Cover sheathing with a breathable roof underlayment. Install complete metal roof system. Developer is to choose the style and color.

(E) (G)

Roof Covering Installation

(Dimensional 30 Year Shingle Shall Be Used On All City of Columbus Funded Projects)

Laminate roof structure with 7/16" OSB sheathing at right angles to rafters; nailed every 10" at center and 6" on edges with 8d common nails. Clean roof deck thoroughly to remove debris and to make ready to accept roof covering. Install minimum of 1 ply, 15 lb. 36" wide asphalt felt and 30 year life, 3 tab asphalt or fiberglass, minimum 250 lb class A, shingles in accordance with the shingle manufacturer's written specifications and with a minimum of four (4) nails per shingle.

- Install self-adhesive Ice-Guard (ice dam protection) beneath all flashings and on all edges and to extend the ice-guard back at least 2' past the interior wall.
- Install new aluminum, enamel-finish drip edge flashing on all edges.
- Install new boot flashings on all vent stacks
- Install new roof ridge vent per manufacturer's printed instructions and install soffit or gable vents to complete the venting system if house has no existing or gable vents.
- Install new metal flashings; (chimney, counter, step, valley).

All debris shall be placed in a dumpster at the end of each day

(E) (G)

Roof Covering Replacement

(Dimensional 30 Year Shingle Shall Be Used On All City of Columbus Funded Projects)

Strip existing roof, removing all roofing and felt. Examine roof sheathing, cornice and eave edges before continuing work. Notify owner of any defects; do not proceed until such defects have been corrected. Pull all nails and re-nail sheathing securely if necessary. Clean roof deck thoroughly to remove debris and to make ready to accept roof covering and new OSB sheathing if applicable (See Sheathing specification) . Install minimum of 1 ply, 15 lb. 36" w asphalt felt and 30 year life, 3 tab asphalt or fiberglass, minimum 250 lb class A, shingles in accordance with the shingle manufacturer's written specifications and with a minimum of four (4) nails per shingle.

- Install self-adhesive Ice-Guard (ice dam protection) beneath all flashings and on all edges and to extend the ice-guard back at least 2' past the interior wall.
- Install new aluminum, enamel-finish drip edge flashing on all edges.
- Install new boot flashings on all vent stacks. Do not paint.
- Install new roof ridge vent per manufacturer's printed instructions and install soffit vents to complete the venting system.
- Install new metal flashings; (chimney, counter, step, valley).

All debris shall be placed in a dumpster at the end of each day.

(E) (G)

“Historic” Roof Covering Installation*(Applicable to eligible historic projects)*

- Laminate roof structure with 7/16" OSB sheathing at right angles to rafters; nailed every 10" at center and 6" on edges with 8d common nails. Clean roof deck thoroughly and make ready to accept roof covering. Install self-adhesive ice-guard (ice-dam protection) beneath all flashings, on all edges and to extend the ice-guard back at least 2' past the interior wall. and on all perimeter edges in accordance with manufacturer's printed instructions, Owens Corning or equal. Install 1 ply, 15 lb, 36" wide asphalt felt underlayment and minimum 240/235 lb. asphalt/fiberglass, class C shingles, minimum 25 year life. Indicate Manufacturer and color below. Owner's choice of color:
- All debris shall be placed in a dumpster at the end of each day.

MANUFACTURER	STYLE	COLOR
Certain Teed	Carriage House (dimensional)	Nickel Gray
GAF	Slateline (dimensional)	English Gray Slate or Weathered Slate
Certain Teed	(standard 3-tab)	Nickel Gray
GAF	Royal Sovereign (standard 3-tab)	Nickel Gray
Owens Corning	(standard 3-tab)	Estate Gray
Tamko	(standard 3-tab)	Antique Slate

(P)

“Historic” Roof Covering Replacement*(Applicable to eligible historic projects)*

Remove existing roofing down to bare sheathing. Examine roof sheathing, cornice and eave edges and rafter tails. Notify the owner of any defects; do not proceed until such defects have been corrected. Pull all roofing nails and re-nail sheathing securely if necessary. If new sheathing is needed, use 7/16" OSB board. Clean deck thoroughly to remove all debris and to make ready to accept roof covering. Install self-adhesive ice-guard (ice-dam protection) beneath all flashings and on all edges and to extend the ice-guard back at least 2' past the interior wall, on all perimeter edges in accordance w/manufacturer's printed instructions, Owens Corning or equal. Install 1 ply, 15 lb, 36" wide asphalt felt underlayment and minimum 240/235 lb. asphalt/fiberglass, class C shingles, minimum 25 year life. Indicate Manufacturer and color below. Owner's choice of color.

All debris shall be placed in a dumpster at the end of each day.

MANUFACTURER	STYLE	COLOR
Certain Teed	Carriage House (dimensional)	Nickel Gray
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Certain Teed	(standard 3-tab)	Nickel Gray
GAF	Royal Sovereign (standard 3-tab)	Nickel Gray
Owens Corning	(standard 3-tab)	Estate Gray
Tamko	(standard 3-tab)	Antique Slate

(P)

NOTE: All roof venting on historic properties are to be complaint with the Historic's Review recommendations.

Slate Roof Repair

Remove damaged material, replace to match existing.

Siding/Exterior Finish

The intent on the exterior finish is to make the home as maintenance free as possible and green compliant.

Developer to choose type, finish and color.

(Below are some examples, but are not limited to just these items)

- Brick
- Fiber Cement Board
- Wood
- Wood Composite
- Stucco
- Vinyl Siding
- Etc.

Site-Work**One Zero-Step Entry**

(If site conditions will allow)

The “no-step” or “zero-step” entry can be located at the front or rear of the structure. It can also be located through the garage, provided that the entrance to the garage from the sidewalk or driveway has a maximum slope of 1:20. Whenever possible, the entrance should be sheltered. If grading is required, the maximum slope is 1:20. The free/clear area outside the door shall be a minimum turning radius of 5'.

(U)

Foundation

(Mandatory – All Projects, If The Site Conditions Will Allow)

- Provide and grade topsoil to create a minimum slope of 5% (6") for the first 10 ft. away from building.
- All gutter, downspouts and conductors are to divert the water away from the foundation thru underground roof drain system.

(G) (H)

Landscaping

(Mandatory – All New Plantings)

NOTE: Plant No Silver Maple Trees

- All new plantings of trees and plants are to be native species and 100% appropriate to the site's soil and climate. Do not include any invasive species. Consult a professional with expertise in Ohio native plants. Any turf must be drought-tolerant.
- Do not use turf in densely shaded areas.
(G)

Existing On-Site Vegetation

(Mandatory – All Projects)

- Minimize disturbance of and damage to trees and other existing vegetation, except all foundation damaging trees/plants which shall be removed from site..
- Prepare designated existing trees and vegetation for impact of construction by pruning, root pruning, fertilizing and watering.
(G)

Surface Water Management

(All Feasible and Applicable Project Sites)

- For a permeable lot, design the lot such that at least 50% of the built environment is permeable or designed to capture water runoff for infiltration on-site.
- For erosion control, if portions of lot are located on a steep slope, reduce long-term runoff effects through use of terracing and retaining walls.
- For erosion control, plant one tree, four 5-gallon shrubs, or 50 square feet of native groundcover per 500 square of disturbed area (including area under roof).
- For runoff from roof, install permanent storm water controls (e.g., vegetated swales, on-site rain garden, dry well, or rain-water cistern) designed to manage runoff from the home.
- Have the site designed by a licensed or certified landscape design or engineering professional such that all water runoff from the home is managed through an on-site design element.

Soil Disturbance and Erosion

(Mandatory – All Projects)

- Schedule construction activities to minimize exposed soil.
- Use alternative means to install utilities, such as tunneling instead of trenching, use of smaller equipment, shared trenches or easements.
- Demarcate limits of clearing and grading.

Water Heaters

(Mandatory – All projects)

Installation

For safety, set water heater temperatures at 120 degrees Fahrenheit.

Water heater to be located within 30 feet of pipe run of all bathrooms and kitchen.

(E) (G)

Hot Water Tank

(Moderate Rehab Only)

Install new 40 gallon Energy Star rated efficient gas water heater, glass-lined, insulated to R-7, with a 10 year warranty, to code. Installation to include pressure and temperature relief valve, discharge tube to within 6" of floor, and all connections to gas and electric systems. If the HWH 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.

(E) (G)

Hot Water Tank

(All New Builds and Gut Rehabs)

Choose one of two options:

- **Power Vented Hot Water Tank:** Install an Energy Star rated, natural gas, 40-gallon, glass-lined, 90+ efficient, power-vented, and insulated to R-7, water heater with a 10 year warranty. Include pressure & temperature relief valve, discharge tube to within 6" of floor, condensate pump, owner's manual & all duct work to power vent to exterior. Provide separate electrical circuit & new gas piping from shut-off valve to fixture. If the HWH 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.
- **Tankless Water Heater w/Storage Tank:** Install a natural gas, interior, tankless water heater system with a minimum 7 gallon per minute flow rate. Include pressure and temperature relief valve, discharge tube to within 6" of floor, owner's manual and all venting, piping. Provide separate electrical circuit and gas inlet and water inlet and outlet shut-off valves, to code.

(E) (G)

Electric Water Heater

(Mandatory if tank water heater is in, or over living space, a drain and drain pan must be installed.)

Only when natural gas is not available in the area.

Windows

(Mandatory – All New and Replacement Installation)

Flashings

Effective flashings must be used on all rough openings, including membrane flashing on bottom of all rough openings for windows, (pan flashing with back dam), and doors using adhesives compatible with drainage plane materials. Also install window and door jamb and head flashing that integrates with drainage plane.

(G) (E)

House Windows: Vinyl, Wood or Fiberglass – Single or Double Hung

- Install only windows that have NFRC ratings that meet or exceed the window requirements for Energy Star Rating.
- All windows are to include screens.

Basement Windows

In basement install either glass block windows with vents or new vinyl/wood windows with screen.

(E) (G)

Appendix

Sample Green Specifications for Housing Rehabilitation for Green Communities Initiative Criteria and AWARE Manual

Thanks for your interest in Green Housing Rehabilitation. Enterprise Community Partners www.enterprisecommunity.org has provided a selection of Housing Rehabilitation Specifications designed in cooperation with representatives of the City of Columbus and Franklin County, Ohio to meet the requirements of both mandatory and optional 2008 Green Communities Criteria (which can be downloaded at www.greencommunitiesonline.org) and the AWARE Manual. These specifications were created with the City of Columbus and Franklin County Ohio in mind. These specifications carry no implicit guarantee of applicability in your individual situation.

The ideal integration of Green Specifications in a local Housing Rehabilitation Program would include:

- customization of the specifications for your climate, housing stock and housing programs,
- training on the use of these specifications, and
- training for contractors as they implement the specifications in your work and/or housing program(s).

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 .

Please keep the following points in mind as you apply these specifications to your housing stock and housing programs.

- The 2008 Green Housing Rehabilitation Specifications are designed for use by construction professionals who can identify the appropriate treatment to address specific building issues. The use of these specifications requires experience in designing housing rehabilitation projects and a strong knowledge of construction.
- They are written with the 2008 Green Communities Criteria and the 2009 City of Columbus/Franklin County AWARE Manual in mind.
- It is necessary to communicate all construction requirements to contractors. Additional training on working with contractors while implementing Green measures is recommended and can be made available through Green Communities. (greencommunitiesonline.org)

NOTE: These specs regularly reference specific products by brand and model number. It is recommended that you include 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.

There are many advantages in specifying a particular brand and model for a component. Where a particular brand and model number is specified in this document we strongly suggest that you investigate the availability of that product or comparable products and call for what is readily available in your market.

Search engines such as Google are powerful tools for specifying products. You can find pricing and availability for materials. The big box home centers provide great access to the products that they typically carry and what products are in stock. For instance it's surprising to see how many Energy Star light fixtures are in stock at The Home Depot and Lowe's Home Improvement Store.

Unit Costs are for estimating purposes and when costs are included there is no warranty for their accuracy. The Unit Costs are included as guidance and rough estimates. The best way to obtain accurate Unit Pricing is to get your contractors to give you line item breakdowns in their bids. With line item pricing it is easy to calculate the Unit Costs and it is easy to pay the contractors for precisely the work that they have completed.

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General Requirements

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
7	Green Communities Initiative—General Requirements	<p>This project is designed to meet the Green Communities Initiative Criteria created by Enterprise Community Partners. The following requirements and other requirements described in specifications with the suffix “GCI” must be strictly adhered to:</p> <ul style="list-style-type: none"> ▪ All paints and primers must meet the Green Seal G-11 Environmental Standard http://www.greenseal.org/certification/standards/paints.cfm ▪ Adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. - http://www.aqmd.gov/rules/reg/reg11/r1168.pdf ▪ All caulks and sealants, including floor finishes, must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District http://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 particleboard components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard edges shall be sealed with a low-VOC sealant or have a factory applied low-VOC sealant prior to installation. All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a low-VOC sealant or have a factory applied low-VOC sealant prior to installation. 	
28	Ventilation—Ashrae 62.2—General Requirements—2008 GCI	<p>Install a ventilation system to meet ASHRAE 62.2 for residential structures under 4 stories when you are undertaking “Substantial Rehabilitation.” See http://www.ashrae.org/technology/page/548 and http://www.buildingscience.com/documents/reports/rr-0502-review-of-residential-ventilation-technologies/</p>	

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
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 housing rehabilitation specialist will notify the contractor of decision to approve or deny the substitution at contract award.	

Site

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
427	Tree—Plant—Ohio	Contact "One Call" prior to locating 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 ½ inch caliper Eastern Redbud (<i>Cercis canadensis</i>), Cockspur Hawthorn (<i>Crateagus crusgalli</i>), American Hophorn-Beam (Ironwood) (<i>Ostrya virginiana</i>) or Common Elder (Sambucus Canadensis) Lacebark Elm (<i>Ulmus parvifolia</i>), Northern Red Oak (<i>Quercus rubra</i>), Hybrid Elms (<i>Ulmus sp.</i>) including staking and a 3" mulch except at the trunk where the soil must be exposed a minimum of four inches. See http://ohioline.osu.edu/b865/index.html for listing of native trees.	EA
550	Regrade Foundation—GCI	Provide and grade a loam topsoil to create at least a 1 to 4 positive drainage away from house 4' from foundation. Seed, fertilize and roll with a local grass approved by the local USDA Extension Office and dehydrated cow manure. Lightly water to saturation. See www.csrees.usda.gov/Extension/index.html for a listing of USDA Extension Offices.	SF
417	Reseed—Fine Fescue—GCI	Reseed the specified area using Tall Fescue seed. Aerate the specified section using a plug style aerator administering 4 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 7 pounds per 1,000 square feet.	SF

Water Conservation

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4667	Storm Drain Labels—GCI	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]!”	EA
7012	Commode— Replace—1.3 GPF—2008 GCI	Install a 1.3 GPF close coupled, white, vitreous china commode such as an American Standard FloWise Compact Cadet 3 EL 3305.000, or any commode tested through the latest “Maximum Performance” (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. 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 November 2008 report. http://www.allianceforwaterefficiency.org/MaP-main.aspx Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shut-off valve, and wax seal.	EA
7014	Commode— Replace—Dual Flush—2008 GCI	Install a “Dual Flush,” 2 piece, close coupled, white, vitreous china commode with flow rates of 1.6 and .9 GPF for its respective high and low flushes, such as a TOTO Aquia CST414M Elongated Front, Dual Flush commode Toilet Kit, or any commode tested through the latest “Maximum Performance” (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. 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 November 2008 report. http://www.allianceforwaterefficiency.org/MaP-main.aspx Include a manufacturer’s approved plastic or pressed wood white seat, supply pipe, shut-off valve, and wax seal.	EA
6935	Shower Head—2 GPM—GCI	Install a chrome plated brass shower head with a maximum 2.0 gallons per minute flow rate. Include arm where required. <i>NOTE: any low-flow showerhead should be controlled by a valve that has been designed, tested, and verified to function safely at the reduced flow rate.</i>	EA
6830	Sink—Single Bowl Complete—GCI	Install a 22 gauge, 25" X 22" X 8" deep, single bowl, stainless steel, self rimming kitchen sink including a steel, metal body faucet, rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves & escutcheon plates on all supply & drain lines. <i>NOTE: All copper is to be soldered (no compression fittings) & all PVC fittings glued.</i>	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6835	Sink—Double Bowl Complete—GCI	Install a 22 gauge 33" X 22" X 8" double bowl, stainless steel, self rimming kitchen sink including a steel, metal body faucet, rated at 2.0 GPM or less, with a 15 year drip- free warranty, grease trap, supply lines, full port ball type shut-off valves & escutcheon plates on all supply & drain lines. NOTE: All copper is to be soldered (no compression fittings) & all PVC fittings glued.	EA
6810	Faucet—Kitchen Sngl Lever—GCI	Install a single lever, washerless, metal bodied faucet with 15 year drip-free guarantee and maximum flow of 2 gallons per minute.	EA
6875	Faucet—Lavatory Single Lever—GCI	Install a washerless, single control, metal bodied faucet with a 15 year drip-free warranty and a maximum flow rate of 2.0 GPM. Include chromed brass shut off valves and trap if not existing.	EA
7181	Bath—3 Fixture Complete—GCI	<p>Re-plumb entire bath to provide fixtures as follows:</p> <p>1) WHITE 5' fiberglass tub/shower unit w/ Delta single lever diverter valve, shower head with a maximum 2.0 GPM flow rate & friction fit chrome shower rod; (note: exterior wall sections behind the tub shower unit must be completely air-sealed prior to installation)</p> <p>2) Install a 1.3 GPF close coupled, white, vitreous china commode such as an American Standard FloWise Compact Cadet 3 EL 3305.000, or any commode tested through the latest "Maximum Performance" (MaP) testing sponsored by Canadian Water and Wastewater Association (CWWA), the California Urban Water Conservation Council (CUWCC), the U.S.-Canadian Alliance for Water Efficiency (AWE) and Veritec Consulting Inc. 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 November 2008 report. http://www.allianceforwaterefficiency.org/MaP-main.aspx Include a manufacturer's approved plastic or pressed wood white seat, supply pipe, shut-off valve, and wax seal.</p> <p>3) 24" plywood vanity w/ cultured marble integrated top, bowl & backsplash & single lever brass bodied chrome faucet with a maximum 2.0 GPM flow rate. Include PVC drain attached to a code legal plumbing vent, use type L copper with brass bodied stops or PEX supply piping, & escutcheon plates on all supply & waste lines.</p>	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6958	Bathtub/Shower—5' Fiberglass—Complete—GCI	Install a 5', 4 piece, Sterling Advantage, 60" X 30" X 72" Product #: 61030126 Tub/Shower—Complete Unit— http://www.sterlingplumbing.com/home.strl - fiberglass tub and shower unit complete with lever operated pop up drain and overflow, PVC waste, single lever shower diverter, shower rod and Delta Faucet "Monitor" Model 1343 tub/shower faucet - http://www.deltafaucet.com/ - & a shower head with a maximum 2.0 GPM flow rate.	EA
8491	Dishwasher—2 Cycle—GCI	Provide and install a 24" white, 2 cycle, built-in Energy Star labeled dishwasher including all alterations and connections to plumbing and electric system. Hotpoint Model: HDA1100NWH—or—GE Model GSD2400NWW.w	EA

Energy Efficiency

Weatherization

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4903	Air Seal Building Envelope—GCI	Seal all accessible cracks, gaps and holes in the building envelope (the barrier between the indoor conditioned space and the outside) with low VOC caulk (if <1/4") or expanding foam (if > 1/4"). 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 large accessible gaps around windows between house framing and window frame – use special care on large sliding-glass doors and vinyl-framed windows: do not use expansive foam on these. 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 that is securely fastened to framing sealing all seams and gaps with fire rated caulk. Seal recessed light fixtures in ceilings that are part of the building envelope and are not rated for insulation contact with an airtight box made of drywall sealed to the ceiling and seal IC rated recessed fixtures with caulk. 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.	SF (of floor area per level)

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4904	Air-Seal—Isolate Garage—GCI	Seal all accessible cracks, gaps and holes in the building envelope between the conditioned space and the attached garage with low VOC caulk (if <math>< 1/4\text{''}</math>) or expanding foam (if >math>> 1/4\text{''}</math>). Seal all wall penetrations created by plumbing, gas lines, electrical boxes and outlets. Take care to seal all joints without excess sealant. Insure an air-seal between the conditioned space and the attached garage at all drywall surfaces. Weatherstrip the entrance door to the house.	SF
4996	Insulate Rim Joist—Foam—GCI	After cleaning the area thoroughly, apply expanding foam to the rim joist at the entire perimeter of the basement and/or crawl space exterior walls. Install to R 19 at a minimum. Use a foam product that meets International Residential Code (IRC), Section R314.5.11, and Underwriters Laboratories, Inc. (UL) classification Certificate R7813 such as Dow FROTH-PAK FS Foam or Handi-Foam Two Component E-84 Class 1 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.	LF
4997	Insulate Rim Joist—Foam Board—GCI	After Air Sealing is complete, carefully install 3 layers of 1 inch Dow THERMAX board along the entire perimeter of the exterior of the building at the Rim Joist. Cut and carefully friction fit the boards between joists perpendicular to the rim joist. Fasten the straight runs of rim joist with construction-grade Polyurethane Adhesive and tack in place with mechanical fasteners. Seal all seams between foam boards 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 a Low VOC caulk. Carefully trim and fit foam boards around penetrations through the rim joist and seal with caulk as stated above.	LF
8050	Cable TV Outlet	Prior to any air sealing of the structure install a cable TV circuit with a connector run from the point of service delivery to a wall jack with a cover plate sized for the coaxial cable and a minimum of 5 feet of cable available outside of the wall jack. Use coaxial cable and connectors approved by the cable service provider for TV system. Exposed and stapled installations of cable are prohibited without the prior written approval of the Housing Rehabilitation Specialist.	EA
8005	Phone Outlet	Install a plaster ring and phone jack wired to the phone service. Stapled, surface-mounted wire is not acceptable unless prior written approval is given by the Housing Rehabilitation Specialist.	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4908	Wall Insulation— Dense Pack Cellulose—GCI	After Air Sealing (Spec # 16-4903) drill 2 1/8" to 2 9/16" access holes for each stud cavity in the areas specified in interior or exterior locations approved by the CM. Install blow in borax 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 1/4" 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 insure that blown cellulose is blocked from entering floor cavities such as 2nd floor floors. See - http://www.karg.com/PDF%20files/Presentations/Dense%20Pack%20Cellulose%20Insulation.pdf and http://www.karg.com/PDF%20files/Insulaton%20density/Sidewall%20Tips%20Pfeiffer%20Wilson%20Fitzgerald%202003.pdf for additional information.	SF
4909	Wall Insulation— Damp Spray Cellulose—2 X 4 Wall—GCI	After all mechanical systems, including but not limited to ductwork, plumbing and wiring, has been installed and after air sealing install a damp-spray cellulose product at a density of 3.25 Pounds per Cubic Foot that conforms to the Consumer Product Safety Commission's 16 Code of Federal Regulations (CFR) Part 1209. 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. After spraying the cellulose will be scrubbed 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.	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4938	Attic Insulation— Cellulose—Dense Pack—GCI	After Air Sealing (Spec # 16-4903) Install blow in borax treated (no ammonium sulfate permitted) cellulose insulation dense-packed into closed floor cavities to a minimum density of 3.5 Lbs. per CF. 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 & interior stairwell walls as part of this item. If access is via a hatch insulate the hatch with 3" 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" thick reflective foil faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.	SF
4935	Attic R-30 Cellulose—GCI	After air sealing (Spec # 16-4903) Install blow in borax treated (no ammonium sulfate permitted), cellulose insulation per manufacturer's specifications to R30. 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 & 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" 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 3" thick reflective foil faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.	SF
4937	Attic R-38 Cellulose—GCI	After air sealing (Spec # 16-4903) blow in borax treated (no ammonium sulfate permitted), cellulose insulation per manufacturer's specifications to R38. 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 & 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" 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 3" thick reflective foil faced polyisocyanurate foam box with seams and seal the edges with a compatible foil tape.	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4912	Insulate Wall/ Ceiling/Floor Cavity—Closed Cell Foam—GCI	Install closed cell polyurethane spray foam into the specified building envelope cavity to the R Value 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 housing rehabilitation specialist responsible for this project 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.	SF

Electrical

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
8137	Update Existing Electric— Bathroom— 2008 GCI	Update the electrical fixtures in the bathroom including: 1) One 20A GFCI receptacle located near sink with a 20 AMP circuit. 2) An Energy Star approved, ceiling mounted Fan/Light fixture w/ an exterior ducted vent fan capable of min. 80 CFM operating at 1 sones or less and vented w/ damper to exterior such as NuTone QTREN080FLT. Switch fan & 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) (set for a 20 minute delay). http://www.energyfederation.org/consumer/default.php/cPath/39_766_134) or equipped with a humidistat sensor. Install metal duct and vent to the exterior ideally through a wall or gable end using a 4" hooded vent with damper. All duct seams shall be sealed with duct mastic. Insulate the ductwork with vinyl or foil faced R 6 minimum duct insulation. Repair any damage to the ceiling from installation and air seal fan/light assembly to the ceiling with low VOC caulk. 3) One wall mounted vanity light fixture such as the Good Earth Lighting 2-Light Brushed Nickel Contemporary Item #: 121104 Model: G1132-BN-I Fixture above the sink.	RM

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
7819	Fan/Light Fixture— Energy Star—2008 GCI	Install an Energy Star approved ceiling mounted Fan/Light fixture rated for a min 100 watts w/ an exterior ducted vent fan capable of min. 80 CFM operating at 1 Sone or less, vented w/ damper to exterior such as NuTone QTREN080FLT. Switch fan & 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) (set for a 20 minute delay). http://www.energyfederation.org/consumer/default.php/cPath/39_766_134 or equipped with a humidistat sensor. Install 4" metal duct and vent to the exterior ideally through a wall or gable end using a 4" hooded vent with damper. All duct seams shall be sealed with duct mastic. 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.	EA
7752	Energy Star Interior Ceiling Fixture—GCI	Install an Energy Star approved, 13 watt florescent ceiling light fixture such as a Lowes Good Earth Lighting 1-Light White Ceiling Flush-mount Item #: 221292 -Model: G2401-TWH-I. Connect to existing wiring.	EA
7753	Energy Star Interior Wall Fixture—GCI	Install an Energy Star approved 13 Watt fluorescent wall fixture such as the Lowes Good Earth Lighting 1-Light Brushed Nickel Contemporary Pocket Wall Sconce Item #: 227470 Model: G3155-NK-I. Connect to existing wiring.	EA
7751	Energy Star Kitchen Ceiling Fixture—GCI	Install an Energy Star approved, 4 – 4' tube, instant start florescent ceiling light fixture, with an acrylic diffuser such as the Lowes - American Fluorescent - Item #: 184346 - Model: PLW432RC. Connect to existing wiring.	EA
8166	Exterior Light Fix- ture—Replace— GCI	Install a 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 from The Home Depot. Connect to existing wiring.	EA
7757	CFL Replacement Lamp	Install a 9 watt CFL medium screw base lamp in the specified light fixture properly disposing of any existing lamp.	EA

HVAC & Domestic Hot Water

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6041	Furnace 90+ Gas —Replace—GCI	<p>Use the Air Conditioning Contractors of America (ACCA) 8th Edition of their Manual J Heat loss calculation tool http://www.acca.org/tech/manualj/ (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J & S reports with first Draw documents. Size furnace to the living unit considering any areas which may be added or subtracted from the plan.</p> <p>Remove existing furnace, recycle all metal components and dispose of all other materials in a code legal dump. FURNACE: install a 90+ gas fired forced air furnace with minimum AFUE rating of 90% on 2" patio block to existing duct work & gas line. New furnace to be vented with PVC piping per manufacturer's specifications. New furnace will have minimum limited warranties of: 20 years on heat exchangers; 5 years on parts. Include auto set back thermostat controls, vent pipe & new shut-off valve. Rework cold air return if necessary to ensure easy access, good fit & easy replacement of air filter. An exterior return air filter box shall be installed on one side, both sides, or bottom of new furnace. Seal all exposed duct joints as a part of this item with Duct Mastic. Remove all existing cloth duct tape prior to installing mastic.</p>	EA
6175	Heat Pump— Replace—16 SEER	<p>Use the Air Conditioning Contractors of America (ACCA) 8th Edition of their Manual J Heat loss calculation tool http://www.acca.org/tech/manualj/ (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J & S reports with first Draw documents. Size furnace to the living unit considering any areas which may be added or subtracted from the plan.</p> <p>Remove existing Heat Pump after removing all CFC and HCFCs, recycle all metal components and dispose of all other materials in a code legal dump. Install a minimum 16 SEER (12.5 EER & 8.5 HSPF) Heat Pump to existing duct work & gas line. Heat Pump will have minimum limited warranties of 5 years on parts. New outdoor heat pump shall be installed on a code approved outdoor pad or lintels and be set on 6" pump-up legs. Include auto set back thermostat controls. Insure that the system ductwork is capable of handling 400 cubic feet per minute per ton of airflow. Rework cold air return if necessary to ensure easy access, good fit & easy replacement of air filter. Seal all exposed duct joints as a part of this item with Duct Mastic. Remove all existing cloth duct tape prior to installing mastic.</p>	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6176	Heat Pump— Replace—13 SEER	<p>Use the Air Conditioning Contractors of America (ACCA) 8th Edition of their Manual J Heat loss calculation tool http://www.acca.org/tech/manualj/ (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J & S reports with first Draw documents. Size furnace to the living unit considering any areas which may be added or subtracted from the plan.</p> <p>Remove existing Heat Pump after removing all CFC and HCFCs, recycle all metal components and dispose of all other materials in a code legal dump. Install a 13 SEER Heat Pump to existing duct work & gas line. Heat Pump will have minimum limited warranties of 5 years on parts. New outdoor heat pump shall be installed on a code approved outdoor pad or lintels and be set on 6" pump-up legs. Include auto set back thermostat controls. Insure that the system ductwork is capable of handling 400 cubic feet per minute per ton of airflow. Rework cold air return if necessary to ensure easy access, good fit & easy replacement of air filter. Seal all exposed duct joints as a part of this item with Duct Mastic. Remove all existing cloth duct tape prior to installing mastic.</p>	EA
7071	HWH—90+ 40 Gal Gas Power Vented—GCI	<p>Replace the existing Hot Water Heater (HWH) with a 40 gallon, glass lined, 90+ efficient power vented, insulated to R-7, gas water heater with a 10 year warranty. Include pressure & temperature relief valve, discharge tube to within 6" of floor, condensate pump, owner's manual & all duct work to power vent to exterior. Provide separate electrical circuit & new gas piping from shut-off valve to fixture. If the HWH 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 HWH.</p>	EA
7072	HWH—Tankless— GCI	<p>Replace existing HWH with a gas fired, closed combustion, tankless water heater with a minimum 7 gallon per minute flow rate. Include pressure & temperature relief valve, discharge tube to within 6" of floor, owner's manual & all venting piping. Provide separate electrical circuit & gas inlet and water inlet and outlet shut-off valves. If the HWH 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 HWH.</p>	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6415	Clothes Dryer Vent—GCI	Install 4" rigid aluminum vent tubing from the specified dryer location to a 4" wall mounted dryer vent hood with a back-flow preventer and NO screening. Do not fasten with nails, screws or other fasteners that protrude into the interior of the exhaust duct. Seal all seams in the system with duct mastic or aluminum foil tape, not duct tape. Secure duct and hood to framing.	EA
6337	Duct Sealing—GCI	Seal joints, collars, flex duct connections and seams in ductwork and plenums with fiberglass mesh and a 1/16 th inch coating of duct mastic (about the thickness of a nickel).	LF
6339	Return Air Transfer Grill 12 X 6—GCI	Install a Tamarack Return Air Pathway (RAP) 12.6 (12" X 6") Sound and light restricted by-pass grill to air balance forced air system - 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.	EA
6340	Return Air Transfer Grill 12 X 12—GCI	Install a Tamarack Return Air Pathway (RAP) 12.12 (12" X 12") Sound and light restricted by-pass grill to air balance forced air system - 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.	EA
6244	Boiler—High Efficiency—Gas Replace—GCI	Replace existing boiler with a Utica UB95M-200 Gas Fired, modulating, direct vent, hot water boiler. Install boiler, connected to the distribution piping & baseboard convectors that service the entire house. Installation to include all power & control wiring, a set back thermostat, expansion tank, one circulation pump, water & gas supply & flue piping. The installation is required to maintain a minimum 70 F indoor temperature when outdoor temperature is -10 F. Min. AFUE rating 95. Remove existing boiler, recycle all metal components and dispose of all other materials in a code legal dump.	EA
6246	Boiler—High Efficiency—Gas Replace Complete—GCI	Replace existing boiler and distribution system with a Utica UB95M-200 Gas Fired, modulating, direct vent, hot water boiler including distribution piping & baseboard convectors to service entire house. Installation to include all power & control wiring, a set back thermostat, expansion tank, one circulation pump, water & gas supply & 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. Min. AFUE rating 95. Remove existing boiler, recycle all metal components and dispose of all other materials in a code legal dump.	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6247	Boiler—High Efficiency— w/ Indirect HWH— GCI	Replace existing boiler with a Gas Fired, modulating, direct vent, hot water boiler. Install boiler, connected to the distribution piping & baseboard convectors that service the entire house. Installation to include all power & control wiring, a set back thermostat, expansion tank, one circulation pump, water & gas supply & flue piping. The installation is required to maintain a minimum 70 F indoor temperature when outdoor temperature is -10 F. Min. AFUE rating 93. 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. Remove existing boiler and hot water heater, recycle all metal components and dispose of all other materials in a code legal dump.	EA

Materials Beneficial to the Environment

Waste Stream

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
797	Disposal—Recycle Cardboard—GCI	Recycle all cardboard generated by construction and all cardboard trash in the house to the local recycling plant. DO NOT dispose of cardboard in any other manner. A \$500 penalty will be assessed to the contract if cardboard is disposed of improperly.	PR

Healthy Living Environment

Paints, Caulks & Sealants

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
5568	Prep & Paint Vacant Room w/ Natural Trim— Low VOC—GCI	Using lead safe work practices remove & dispose of all loose material & dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond & fiberglass mesh tape. If plaster & lath boards are loose, re-secure or remove & replace with drywall patch. TRIM REPAIR: Repair all trim as necessary w/ A STAIN-ABLE WOOD FILLER shaped & 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 a HEPA filtered sanding vacuum or a wet sanding method. CEILINGS & WALLS: Prime as necessary to seal stains, raw plaster, etc. Paint ceilings two coats in FLAT CEILING WHITE & walls in EGGSHELL OR SATIN finish cut-in neatly to trim & at all corners & edges. NATURAL TRIM & DOORS: Clean & prep all trim. Rub down & remove all paint, marks, dirt etc. & blend finish in areas where it has been removed (gouges, etc.). Coat all trim using a combination stain/water based polyurethane finish of natural or golden oak color. PAINTS: Use Sherwin-Williams or approved best grade paints and primers meeting the Green Seal G-11 Environmental Standard http://www.greenseal.org/certification/standards/paints.cfm . All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District http://www.baaqmd.gov/dst/regulations/rg0851.pdf . COLOR(S): Wall color selected by CM.	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
5567	Prep & Paint Vacant Room W/ Painted Trim—Low VOC—GCI	<p>Using lead safe work practices remove & dispose of all loose material & dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond & fiberglass mesh tape. If plaster & lath boards are loose, re-secure or remove & replace with drywall patch.</p> <p>CEILINGS & WALLS: Prime as necessary to seal stains, raw plaster, etc. Paint ceilings two coats in FLAT CEILING WHITE & walls in EGGSHELL OR SATIN finish cut-in neatly to trim & at all corners & edges.</p> <p>TRIM & DOORS: Prep by de-glossing painted trim prior to finish painting. Apply two coats LATEX SEMI-GLOSS paint to cover completely & uniformly. PAINTS: Use Sherwin-Williams or approved best grade paints and primers meeting the Green Seal G-11 Environmental Standard http://www.greenseal.org/certification/standards/paints.cfm. Adhesives must comply with Rule 1168 of the South Coast Air Quality Management District - 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 http://www.baaqmd.gov/dst/regulations/rg0851.pdf. COLOR(S): Wall color selected by CM. Trim to be WHITE unless otherwise specified.</p>	SF
5610	Vapor Barrier Primer—Low VOC—GCI	<p>Using lead safe work practices remove & dispose of all loose material & dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond & fiberglass mesh tape. If plaster & lath boards are loose, re-secure or remove & replace with drywall patch.</p> <p>CEILINGS & WALLS: 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. PAINTS: Use Sherwin-Williams or approved best grade paints and primers meeting the Green Seal G-11 Environmental Standard http://www.greenseal.org/certification/standards/paints.cfm.</p>	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
5677	Prep & Paint Exterior Trim— Low VOC—GCI	<p>Using lead work safe practices, remove & properly dispose all loose materials prior to installation of new materials. Using lead work safe practices, prepare existing trim 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. Prepare trim surfaces by removing all loose paint using lead work safe practices & according to paint manufacturer's recommendations. 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 areas. Apply two coats of quality exterior LOW VOC paint to specified trim. All paints and primers must meet the Green Seal G-11 Environmental Standard http://www.greenseal.org/certification/standards/paints.cfm.</p> <p>Adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District http://www.baaqmd.gov/dst/regulations/rg0851.pdf. Match existing color as close as possible. All work to be done in a neat & professional manner. Use care to protect all surfaces not intended for paint coverage.</p>	SF
2351	Floor—Refinish Wood Low VOC— GCI	<p>Counter sink all nails and fill holes. Drum sand and edge floor finishing with 120 grit sandpaper. Vacuum and tack rag room. Apply a coat of Minwax Water Based Polyurethane Base Coat followed by 3 coats of Minwax Water-Based Polyurethane for Floors, or a floor finish that complies with regulation 8, rule 51, of the Bay Area Air Quality Management District http://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.</p>	SF
5971	Carpet (Berber) & Pad—Green Label—GCI	<p>Install FHA approved, Nylon/Olefin blend Berber weave carpet. Install over a matched ½" medium density rebond pad w/ a minimum of seams. Carpet and Pad must meet the Carpet and Rug Institute's Green Label certification. Stretch carpet to eliminate puckers, scallops & ripples. Cover entire floor including closets using tackless strips to fasten carpet at walls and vinyl floor transition strips that meet the ADA 4.5.2 requirement at transitions to other floor surfaces.</p> <p><i>ALLOWANCE: Carpet & pad \$14.00/sy.</i></p>	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
5972	Carpet (Cut Pile) & Pad—Green Label—GCI	Install FHA approved, Nylon/Olefin blend cut pile weave carpet. Install over a matched ½" medium density rebond pad w/ a minimum of seams. Carpet and Pad must meet the Carpet and Rug Institute's Green Label certification. Stretch carpet to eliminate puckers, scallops & ripples. Cover entire floor including closets using tackless strips to fasten carpet at walls and vinyl floor transition strips that meet the ADA 4.5.2 requirement at transitions to other floor surfaces. <i>ALLOWANCE: Carpet & pad \$14.00/sy.</i>	SF

Kitchen Cabinets

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
3716	Cabinet— Wood Base—Plywood—GCI	Install base cabinets constructed of solid hardwood face-frames, doors and draw fronts with ½" plywood carcasses & floors. Drawer boxes shall be plywood, joined using metal or plastic corner bracing. Install bright brass or brushed chrome knobs & pulls on all doors & drawers even when routed finger grooves exist. CM will choose style & finish from those available in line proposed by contractor.	LF
3726	Cabinet— Wood Wall—Plywood—GCI	Remove & dispose off site all existing upper cabinets, counters, ledgers, etc. NOTE: Upper cabinets will be either: a) 42" installed to ceiling OR b) will be 36" trimmed with a stained oak crown, OR c) will be 36" with a trimmed drywall or plywood soffit. Install upper cabinets constructed of solid hardwood face-frames and doors with ½" plywood carcasses & floors. Carcasses will be joined using metal or plastic corner bracing. Install bright brass or brushed chrome knobs & pulls on all doors even when finger grooves exist. CM will choose style & finish from those available in line proposed by contractor.	LF
3717	Cabinet—Wood Base—Low VOC—GCI	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 components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard edges shall be sealed with a clear low VOC sealant or have a factory applied sealant prior to installation. All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a clear low-VOC sealant or have a factory applied low-VOC sealant prior to installation. Install bright brass or brushed chrome knobs & pulls on all doors & drawers even when routed finger grooves exist. CM will choose style & finish from those available in line proposed by contractor.	LF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
3727	Cabinet—Wood Wall—Low VOC —GCI	Remove & dispose off site all existing upper cabinets, counters, ledgers, etc. NOTE: Upper cabinets will be either: a) 42" installed to ceiling OR b) will be 36" trimmed with a stained oak crown, OR c) will be 36" 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 components shall meet ANSI A208.1 for formaldehyde emission limits or all exposed particleboard edges shall be sealed with a clear low-VOC sealant or have a factory applied sealant prior to installation. All MDF edges shall meet ANSI A208.2 for formaldehyde emission limits or all exposed MDF edges shall be sealed with a clear low-VOC sealant or have a factory applied low-VOC sealant prior to installation. Install bright brass or brushed chrome knobs & pulls on all doors even when finger grooves exist. CM will choose style & finish from those available in line proposed by contractor.	LF
3747	Replace Counter Top—Plastic Laminate—GCI	Dispose of existing counter top. Field measure for sizing. Seal all bare wood and wood composite surfaces including the underside of the countertop with a low VOC sealant. Screw to base cabinet a square edged plastic laminate counter top. 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.	LF

Radon

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
2040	Radon—Vent Con- crete Slab (Passive)	Create a sub-slab vent for the Radon Gas by breaking up the specified portion of the slab and excavating to allow for a 4" concrete slab flush with the existing and 8" of ¾" stone. Grade and tamp soil to provide solid base. Install the ¾" stone and install a 6" PVC Tee connected to a 4" PVC pipe in the stone base vented above the roof line to a Schedule 20 PVC varmint guard cap and flashed to the roof with a metal based neoprene boot. The vent should be installed a minimum of 12" above the roof and a minimum of 10' away from any window or other opening that could bring the exhausted radon gases into the residence. Install a continuous 6 mill plastic vapor barrier between the stone and the concrete sealed carefully to the vent pipe. Pour a 4", 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.	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
2041	Radon—Vent Concrete Slab—Sump (Passive)	Create a sub-slab vent for the Radon Gas by installing a 6" PVC Tee connected to a 4" PVC pipe in the sump hole and vented above the roof line to a Schedule 20 PVC varmint guard 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.	EA
2042	Radon—Seal—Vent—Insulate Crawl Space (Passive)	<p>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 caulking 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. After the plastic vapor barrier has been inspected and approved by the Housing Rehabilitation Specialist responsible for this property install a minimum R13 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.</p> <p>Install a 6" PVC Tee under the plastic vapor barrier connected to a 4" PVC pipe that is sealed to the plastic vapor barrier and vented above the roof line to a Schedule 20 PVC varmint guard cap and flashed to the roof with a metal based neoprene boot.</p>	EA
2043	Radon—Make Passive System Active	Install a Fantech HP 2190 Radon fan unit in specified location wired directly to the electrical panel from a junction box installed within 6' of the fan. Use rubber boots to connect the fan to the 4" vent.	EA

Pest Control

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
8395	Integrated Pest Management—GCI	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 to prevent access by pests. Use Stuff-it copper mesh by Do It Yourself Pest Control - http://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, in wall cavities, cracks and crevices in the kitchen.	DU

Ventilation

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
7836	Kitchen Range Hood—Vented—GCI	Install an exterior ducted enameled range hood with integral minimum 2 speed fan control and light switched separately capable of a minimum 150 cfm at a maximum of 10 sones. Attach hood to cabinet with screws. Include metal vent with all seams sealed with duct mastic, and roof or wall cap/damper assembly flashed appropriately for the exterior finish. Owner's choice of color.	EA
7819 <i>(included earlier under Electrical)</i>	Fan/Light Fixture—Energy Star—GCI	Install an Energy Star approved ceiling mounted Fan/Light fixture rated for a min 100 watts w/ an exterior ducted vent fan capable of min. 80 CFM operating at 1 Sone or less, vented w/ damper to exterior such as NuTone QTREN080FLT. Switch fan & 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) http://www.energyfederation.org/consumer/default.php/cPath/39_766_134) or equipped with a humidistat sensor. Install 4" metal duct and vent to the exterior ideally through a wall or gable end using a 4" hooded vent with damper. All duct seams shall be sealed with duct mastic. 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.	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
7821	Fan/Light Fixture —Energy Star— Continuous with Motion Activated Boost—GCI	Install a Panasonic Whisper Green-Lite Model # FV-08VKML1 ceiling mounted Fan/Light fixture with a modulating DC motor capable of 80 CFM operating at less than .3 Sones, switched by a built in motion detector and night light, vented w/ damper to exterior. Install 4" galvanized metal duct (not flex duct) and vent to the exterior ideally through a wall or gable end using a 4" hooded vent with damper. All duct seams and connections shall be sealed with duct mastic. 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.	EA
7822	Fan/Light Fixture —Energy Star— Continuous with Switch Activated Boost—GCI	Install a Panasonic Whisper Green-Lite Model # FV-08VKSL1 ceiling mounted Fan/Light fixture with a modulating DC motor capable of 80 CFM operating at less than .3 Sones, with a night light, vented w/ damper to exterior. Switch fan & 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) http://www.energyfederation.org/consumer/default.php/cPath/39_766_134) or equipped with a humidistat sensor. Install 4" galvanized metal duct (not flex duct) and vent to the exterior ideally through a wall or gable end using a 4" hooded vent with damper. All duct seams and connections shall be sealed with duct mastic. 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.	EA
6042	Active Fresh Air Intake—Forced Air System— Aprilaire—GCI	Install an Aprilaire Model 8126 Ventilation Control System with temperature and humidity shut-offs 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. http://www.aprilaire.com	EA

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
6043	Active Fresh Air Intake—Forced Air System—Skuttle—GCI	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 exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents. http://www.skuttle.com/216.html	EA
6003	Passive Fresh Air Intake—GCI	Install a Tamarack passive intake vent (www.efi.org) installed through the specified exterior wall, flashed to be weather-tight, and sealed to the building envelope's air barrier and interior & 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 exhausts, clothes dryer exhaust, outside cooking facilities, laundry dryer vent, exhaust vent of heating units or bath and kitchen exhaust fan vents.	EA
4957	Seal and Insulate—Crawl Space	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 caulking rated to adhere plastic. Overlap seams in the plastic by 2 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. After the plastic vapor barrier has been inspected and approved by the Housing Rehabilitation Specialist responsible for this property install a minimum R13 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.	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4727	Roof Ventilation— Combined Soffit and Ridge	Install 1 SF of combined Soffit and Ridge ventilation for every 300 SF 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.	SF

Water, Moisture and Mold Management

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
4981	Insulate Domestic Water Supply Pipe—GCI	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 4 inches. Seal all butt joints between sections of pipe with 5 mil Pipe Insulation sealing tape. Neatly miter all angled junctions.	LF
5416	Tile Backer Board —Cementitious— GCI	Install ½" fiberglass reinforced cement composition boards such as Durock or HardieBacker in area specified to accept ceramic tile. Space edges ¼" from adjoining surfaces and fasten with minimum 1-¼" long No. 8 x 0.375" HD self-drilling corrosion-resistant ribbed wafer-head screws (i.e. 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 thinset mortar using a ¼' square notched trowel. On walls, all edges of backer boards must be supported by full face 2' framing secured to the structure. On floors, backer board must be installed on ¾' plywood over joists 16" on center or the joist/subfloor assembly must meet the manufacturer's specifications.	SF

<i>Spec #</i>	<i>Spec Title</i>	<i>Spec Description</i>	<i>Unit of Measure</i>
912	Basement Slab Installation—GCI	Install a continuous 4" thick basement slab using a 3,000 psi mix. Make sure that the soil is uniformly and properly compacted, Install a 4" bed of ¾" 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" and taped at seams if seams are absolutely necessary. Install a 2 inch layer of gravel on top of the vapor barrier and place the concrete. 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" intervals.	SF
2567	Siding—Hardiplank—GCI	Prepare surface by removing nails, repairing sheathing, applying house-wrap and Hardiplank siding strictly to manufacturer's specifications. Install 1" X 8 ¼" Hardiplank lap siding to the surface using hot-dipped galvanized nails or stainless steel nails driven at least 1" into studs. Stagger joints in adjacent pieces and center all butt joints over studs. Either install joints with a 3 mm 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 sheathing behind each joint to flash the vertical seam. Where Hardiplank butts up against an accessory fill joint with a 6 mm fillet of Hardiplank caulking.	SF
8722	Carbon Monoxide Detector—GCI	Install at each sleeping area, minimum of one per floor, a hard wired or plug-in carbon monoxide detector with audible alarm, battery back up and with 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 carbon monoxide the unit is sensing.	EA

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