

## Cuyahoga County Green Communities Sample Specs for NSP Rehabilitation

Thanks for your interest in Green Housing Rehabilitation. Enterprise Community Partners [www.enterprisecommunity.org](http://www.enterprisecommunity.org) has provided a selection of Housing Rehabilitation Specifications designed to meet the requirements of both mandatory and optional 2008 Green Communities Criteria (which can be downloaded at [www.greencommunitiesonline.org](http://www.greencommunitiesonline.org) ). These specifications were created with Cuyahoga County and a cold climate in mind and must be reviewed and adapted to your specific climate and housing stock. These specifications carry no implicit guarantee of applicability in your individual situation.

Select from the following specifications based on a green development plan incorporating an integrated design approach. Some GCI specs have optional points associated with them while others are mandatory requirements of the Green Communities Criteria. 35 Optional points are required (30 points for moderate rehab).

The Cuyahoga County Green Communities Criteria have been customized from the national Enterprise Green Communities Criteria. Contact the County Department of Development for complete NSP requirements.

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

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).

Enterprise is eager to assist you in arranging for such technical assistance and training. Please feel free to contact us at [greencommunities@enterprisecommunity.org](mailto:greencommunities@enterprisecommunity.org).

These specifications are based on Enterprise Green Communities specifications that are available as part of the Library of Specification in the Housing Developer Pro<sup>®</sup> (HDP) software product. HDP automates specification writing and cost estimating. A fully functional 30 day demo of HDP is available at [www.CommunityDevelopmentSoftware.com](http://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 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](http://greencommunitiesonline.org))

Note: These specs may 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 Home Depot and Lowes.

# Green Housing Rehabilitation Specs

## General Requirements

Spec #	Spec Title	Spec Description	Requirement Status
7	GREEN COMMUNITIES INITIATIVE—	This project is designed to meet the Green Communities Initiative (GCI) Criteria created by Enterprise Community Partners and customized for Cuyahoga County. The following specs are based on a green development plan incorporating an integrated design approach. As the select contractor, you are becoming part of the Green Development Team and are expected to help meet all of the project's performance goals. Some GCI specs have optional points associated with them while others are mandatory requirements of the Green Communities Criteria. Please contact the Cuyahoga County Department of Development for complete NSP Green Communities Requirements.	
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.	

	GCI 8.1	Provide a manual that includes the following: a routine maintenance plan; instructions for all appliances, HVAC operation, water-system turnoffs, lighting equipment, paving materials and landscaping, pest control and other systems that are part of each occupancy unit; an occupancy turnover plan that describes the process of educating the tenant about proper use and maintenance of all building systems.	Mandatory
	GCI 8.2	Provide a guide for homeowners and renters that explains the intent, benefits, use and maintenance of green building features, along with the location of transit stops and other neighborhood conveniences, and encourages additional green activities such as recycling, gardening and use of healthy cleaning materials, alternate measures for pest control, and purchase of green power.	Mandatory
	GCI 8.3	Provide a walk-through and orientation to the homeowner or new resident using the Occupant Manual from 8-2 above that reviews the building's green features, operations and maintenance along with neighborhood conveniences.	

### 3. Site

Spec #	Spec Title	Spec Description	Requirement Status
	GCI 3.1	Conduct a Lead Risk Assessment in accordance with county guidelines and provide a plan for abatement if necessary.	Mandatory
	GCI 3.2	For any excavation work, implement EPA's Best Management Practices for erosion and sedimentation control during construction referring to the EPA document, Storm Water Management for Construction Activities.	
	Landscaping GCI 3.3	Plant list provided (or to be selected) must be based on a selection of trees and plants that are appropriate to the site's soils and microclimate and do not include invasive species. Select at least 50% native species. Locate plants where they will provide shading in summer and allow for heating gain in the winter. See <a href="http://ohioline.osu.edu/b865/index.html">http://ohioline.osu.edu/b865/index.html</a> for listing of native trees. Use as a reference the native plant list compiled by the Native Plant Promotion	

		Committee of the Lake Erie Allegheny Partnership for Biodiversity (L.E.A.P.) The plant list contains readily available native plants organized by type of soil and sun needs. The LEAP Native Plant Promotion Committee was created in order to educate the public about the many benefits of native plants in the LEAP region and to join the nursery and landscaping trade in promoting the buying, selling, propagating and planting of our area's native plant species. Beginning in August 2010 the list will be available online at <a href="http://leapbio.org/index.php">http://leapbio.org/index.php</a> .	
427	General TREE—PLANT detail	Contact " "OUPS" (Ohio utility protection service) to identify the location of underground utilities, prior to digging. Do not plant the tree where it will interfere with 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, and have a 3" mulch except at the trunk where the soil must be exposed a minimum of four inches. See <a href="http://leapbio.org/index.php">http://leapbio.org/index.php</a> or <a href="http://ohioline.osu.edu/b865/index.html">http://ohioline.osu.edu/b865/index.html</a> for listing of native trees.	Mandatory
	Surface Water Management GCI 3.4	Capture, retain, infiltrate and or harvest the first ½" of rainfall that falls in a 24-hr period.	5 pts
550	REGRADE FOUNDATION— GCI	Provide and grade a loam topsoil to ensure proper drainage to avoid standing water. Request a sample of the topsoil material before delivery. Seed, fertilize and roll with a locally appropriate grass dehydrated cow manure. Choose the	Mandatory

	Surface Water Management	grass type based on the recommendations provided at <a href="http://ohioline.osu.edu/hyg-fact/4000/4011.html">http://ohioline.osu.edu/hyg-fact/4000/4011.html</a> .Lightly water to saturation.	
417	RESEED--FINE FESCUE--GCI	Reseed the specified area using Tall Fescue seed or Fine Fescue. 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 1000 square feet in a complete fertilizer. Gently rake the fertilizer into the soil and apply the Fescue seed evenly at a rate of 7 pounds per 1,000 square feet. Optional source for low mow fescue: Oliger Seed, <a href="http://www.oligerseed.com">www.oligerseed.com</a>	
4667	STORM DRAIN LABELS—GCI 3.5	Label all public 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 – drains to Lake Erie”	2 Pts

#### 4. Water Conservation

Spec #	Spec Title	Spec Description	Requirement Status
	Water conservation 4.1	Install water conserving fixtures with the following minimum specifications: toilet 1.3 GPF; showerheads 2.0 GPM; kitchen faucets 2.0; bathroom faucets 2.0 GPM. Use products with EPA’s WaterSense label (for toilets and faucets).	Mandatory
	Water conservation 4.1c	Install water conserving fixtures with the following minimum specifications: toilet 1.1 GPF; showerheads 1.75 GPM; kitchen faucets 2.0; bathroom faucets 1.5 GPM Use products with EPA’s WaterSense label (for toilets and faucets).	5 points
	Efficient Irrigation 4.2	Any irrigation must be designed by an EPA Water Sense professional, to meet efficiency requirements.	Mandatory

6830	SINK - SINGLE BOWL COMPLETE--GCI	Install a 22 gauge, 25"x22"x6-8" 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. NOTE: All copper is to be soldered (no compression fittings) & all PVC fittings glued.	
6835	SINK - DOUBLE BOWL COMPLETE--GCI	Install a 22 gauge 33"x22"x8" 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.	
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.	
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.	

7181	BATH - 3 FIXTURE COMPLETE— GCI	<p>Re-plumb entire bath to provide fixtures as follows:</p> <p>1) 5' fiberglass tub/shower unit w/ Delta single lever diverter valve, shower head with a maximum 2.0 GPM flow rate &amp; friction fit chrome shower rod; (note: exterior wall sections behind the tub shower unit must be completely insulated, air-sealed, and documented 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.  <a href="http://www.allianceforwaterefficiency.org/MaP-main.aspx">http://www.allianceforwaterefficiency.org/MaP-main.aspx</a> 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 &amp; backsplash &amp; 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, &amp; escutcheon plates on all supply &amp; waste lines.</p>	
6958	BATHTUB/SHOW ER—5' FIBERGLASS— COMPLETE— GCI	<p>Install a 5', 4 piece, Sterling Advantage™, 60" x 30" x 72" Product #: 61030126 Tub/Shower - Complete Unit - <a href="http://www.sterlingplumbing.com/home.strl">http://www.sterlingplumbing.com/home.strl</a> - 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 - <a href="http://www.deltafaucet.com/">http://www.deltafaucet.com/</a> - &amp; a shower head with a maximum 2.0 GPM flow rate. The Tub/Shower unit includes blocking for future grab bars.</p>	
8491	DISHWASHER--2 CYCLE--GCI	<p>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 or equal (based on performance ratings).</p>	

## 5. Energy Efficiency

Spec #	Spec Title	Spec Description	Requirement Status
	5.1 Energy Star	Meet Energy Star standards (single family and low rise residential); exceed ASHRAE 90.1 2004 by 15 % for residential structures above four stories, or, for moderate rehab, reduce energy use by 15%	Mandatory
	Air sealing:	Follow Energy Star, Thermal Bypass Checklist link for air sealing details:  <a href="http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.thermal_bypass_checklist">http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.thermal_bypass_checklist</a>	Will help to achieve mandatory 15% reduction and receive energy points
	5.2 Appliances	Install Energy Star clothes washers, dishwashers and refrigerators	Mandatory
	5.3 Lighting	Install energy star advanced lighting package, including daylight sensors or timers on exterior lights.	Mandatory
	5.4 Electric Meter	Install individual or sub-metered electric meters.	Mandatory
	5.6 Renewables	Photovoltaic or solar thermal collector ready. Design, engineer and wire (or provide adequate chase), unit to accommodate future installation of renewable.	2 points
	Roofing GCI 6.5	Use Energy Star-compliant roofing shingles.	5 points

4903	AIR SEAL BUILDING ENVELOPE--GCI	Seal all accessible cracks, gaps and holes in the building enclosure (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:If using spray foam, use only, low expansion foam that will not bow and damage window frames. Window frame must be adequately shimed and secured (even for the low expansion foams). Take care to seal all joints.. Seal any gaps in the conditioned building enclosure 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.	Mandatory
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 <1/4") or expanding foam (if > 1/4"). Seal all wall penetrations created by plumbing, gas lines, electrical boxes and outlets. Take care to seal all joints. Insure an air-seal between the conditioned space and the attached garage at all drywall surfaces. Weatherstrip the entrance door to the house and install automatic closer (per code).	
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.	

4997	INSULATE RIM JOIST— FOAM BOARD-	<p>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 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.</p> <p>Alternative option for rim joist air seal and insulation: Air seal rim joist cavity (which can be done with one 1" layer of rigid board, foam, caulk, or may be done from exterior (depending on exterior access and outer applications); Install bat insulation, and then install one, 1" layer of Dow THERMAX™ board, or fire retardant/resistant ISO board (to block in the bat insulation into a closed cavity (6 sided sealed box). Rigid foam board should be caulked or foamed around the perimeter, to ensure air seal.</p>	
8050	CABLE TV OUTLET	<p>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.</p>	
8005	PHONE OUTLET	<p>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.</p>	

4908	WALL INSULATION --DENSE PACK CELULOSE-	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 2 <sup>nd</sup> floor floors.	
4909	WALL INSULATION --DAMP SPRAY CELLULOSE -2X4 WALL-	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.	
4938	ATTIC INSULATION - CELLULOSE --DENSE PACK--GCI	After Air Sealing (Spec # 16-4903) Install blown (?) 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.	

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.	
4912	INSULATE with— CLOSED CELL FOAM- -GCI	Spray closed cell polyurethane foam into or onto the specified building cavity or space to the R Value specified for this project. Moisture content of all components of the cavity must be less than 11% at the time of the application of the foam.	
	Insulate with Open cell spray foam	Spray open cell foam to specified R value, for added air sealing of bypass and open cavity conditions, such as rim joists.	
	Insulate	Insulate and air seal with exterior rigid foam insulation, to the specified R value. Overlap (if using two layers of staggered seam) or tape and seal all joints. Fasten to exterior wall with appropriate fasteners and strapping. Provide drainage plane and air space on top of rigid foam surface, below strapping as necessary for securing the material as well as is whatever is necessary for the siding install.	
	Insulate	Air seal all seams, cracks, stud connection points and penetrations prior to installing blown in or bat insulation. Fiberglass, cellulous (or alt) all to be installed per manufactures specifications. Loose fill and or the above mentioned dense pack products must be installed in a sealed 6 sided cavity, and per Energy Star Thermal Bypass checklist. Rim joists must be treated differently than areas that will be closed wall cavities.	

## Electrical

Spec #	Spec Title	Spec Description	Requirement Status
8137	UPDATE EXISTING ELECTRIC – BATHROOM— 2008 GCI	<p>Update the electrical fixtures in the bathroom including:</p> <ol style="list-style-type: none"> <li>1) One 20A GFCI receptacle located near sink with a 20 AMP circuit.</li> <li>2) An Energy Star approved, ceiling mounted Fan exhaust/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 &amp; 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)..  <a href="http://www.energyfederation.org/consumer/default.php/cPath/39_766_134">http://www.energyfederation.org/consumer/default.php/cPath/39_766_134</a>) or equipped with a humidistat sensor. Install rigid metal duct and vent to the exterior 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 with a vapor barrier sleeve over the insulation . Repair any damage to the ceiling from installation and air seal fan/light assembly to the ceiling and at the enclosure penetration, with low VOC caulk.</li> <li>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.</li> </ol>	

Spec #	Spec Title	Spec Description	Requirement Status
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). <a href="http://www.energyfederation.org/consumer/default.php/cPath/39_766_134">http://www.energyfederation.org/consumer/default.php/cPath/39_766_134</a> 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.	
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.	
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.	
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.	
8166	EXTERIOR LIGHT FIXTURE—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 Home Depot. Connect to existing wiring.	

7757	CFL REPLACEMENT LAMP	Install a 9 watt CFL medium screw base lamp in the specified light fixture properly disposing of any existing lamp.	
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### HVAC & Domestic Hot Water

Spec #	Spec Title	Spec Description	Requirement Status
	Mechanical ventilation- Remove chimney	When upgrading mechanical ventilation of heating units, abandon the use of draft induced units and the chimneys that were designed for them. Abandon/ remove the chimney. Patch hole in roof to match.	
	Combustion equipment GCI 7.18	Only use power vented or combustion sealed equipment. Install one hard-wired CO detector for each sleeping area, minimum one per floor.	

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 <a href="http://www.acca.org/tech/manualj/">http://www.acca.org/tech/manualj/</a> (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection.</p> <p>Provide both Manual J &amp; 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, 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 &amp; gas line. New furnace to be two pipe, sealed combustion 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 &amp; new shut-off valve.</p> <p>Rework cold air return if necessary to ensure easy access, good/ healthy fit &amp; easy replacement of air filter. Cold air return should draw air from a clean and healthy space. Air returns should be ducted to the conditioned living space, rather than pulled from the basement floor, (avoid and correct what is known as the "Cleveland Drop"). 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>	
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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 <a href="http://www.acca.org/tech/manualj/">http://www.acca.org/tech/manualj/</a> (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J &amp; 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, recycle all metal components and dispose of all other materials in a code legal dump. Follow local and federal regulations regarding disposal of CFCs and HCFCs. Install a minimum 16 SEER (12.5 EER &amp; 8.5 HSPF) Heat Pump to existing duct work &amp; 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/healthy fit &amp; easy replacement of air filter. Cold air return should draw air from a clean and healthy space. Air returns should be ducted to the conditioned living space, rather than pulled from the basement floor, (avoid and correct what is known as the "Cleveland Drop"). 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>	
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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 <a href="http://www.acca.org/tech/manualj/">http://www.acca.org/tech/manualj/</a> (calculate manual J based on the post rehab building envelope), and use ACCA's Manual S for equipment selection. NOTE: Provide both Manual J &amp; 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, recycle all metal components and dispose of all other materials in a code legal dump. Follow local and federal regulations regarding disposal of CFCs and HCFCs. Install a 13 SEER Heat Pump to existing duct work &amp; 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 &amp; 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>	
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 &amp; temperature relief valve, discharge tube to within 6" of floor, condensate pump, owner's manual &amp; all duct work to power vent to exterior. Provide separate electrical circuit &amp; 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>	
7072	HWH— TANKLESS-- GCI	<p>Replace existing WH with a gas fired, closed combustion, tankless water heater with a minimum 7 gallon per minute flow rate. Include pressure &amp; temperature relief valve, discharge tube to within 6" of floor, owner's manual &amp; all venting piping. Provide separate electrical circuit &amp; 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 WH.</p>	

Spec #	Spec Title	Spec Description	Requirement Status
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.	Mandatory
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).	
6339	RETURN AIR TRANSFER GRILL 12X6--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 - <a href="http://www.tamtech.com">www.tamtech.com</a> , or similar. Install in stud cavity between specified room and common space to provide return air. Seal to wall finish and install flange trim.	
6340	RETURN AIR TRANSFER GRILL 12X12--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 - <a href="http://www.tamtech.com">www.tamtech.com</a> , or similar. Install in stud cavity between specified room and common space to provide return air. Seal to wall finish and install flange trim.	
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.	
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.	

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.	
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### 6. Materials Beneficial to the Environment

Spec #	Spec Title	Spec Description	Requirement Status
	Waste management GCI 6.1	Develop, implement, and document waste management plan that reduces the amount of materials sent to the landfill by at least 25%. Utilize local sorting/recycling facilities such as Rosby Resource Recovery or Kurtz Brothers, or any others that provide job waste tracking.	5 points

## 7. Healthy Living Environment

Spec #	Spec Title	Spec Description	Requirement Status
	Paints and Primers GCI 7.1	All interior paints and primers must comply with current Green Seal standards for low VOC.	Mandatory
	Adhesives and Sealants GCI 7.2	All adhesives must comply with Rule 1168 of the South Coast Air Quality Management District. Caulks and sealants must comply with Regulation 8, Rule 51 of the Bay Area Air Quality Management District. "Low voc" in this document references these standards.	Mandatory
	GCI 7.3	Use particleboard and MDF that is certified compliant with the ANSI A208.1 and A208.2. If using nonrated composite wood, all exposed edges and sides must be sealed with low-VOC sealants.	Mandatory
5568	Floor Coverings GCI 7.4	No carpets in below grade living spaces, entryways, laundry rooms, bathrooms, kitchens or utility rooms. For other rooms, use the Carpet and Rug Institute's Green Label certified carpet, pad and carpet adhesives.	Mandatory
	GCI 7.5a	Install Energy Star-labeled bathroom fans that exhaust to the outdoors and are connected to a light switch and are equipped with a humidistat sensor or timer, <i>or</i> operate continuously.	Mandatory
	GCI 7.5b	Install power vented fans or range hoods that exhaust to the exterior.	Mandatory
	Ventilation GCI 7.6	Install a ventilation system to meet ASHRAE 62.2 for residential structures under 4 stories when you are undertaking "Substantial Rehabilitation." See <a href="http://www.ashrae.org/technology/page/548">http://www.ashrae.org/technology/page/548</a> and <a href="http://www.buildingscience.com/documents/reports/rr-0502-review-of-residential-ventilation-technologies/">http://www.buildingscience.com/documents/reports/rr-0502-review-of-residential-ventilation-technologies/</a>	10 pts for moderate, Mandatory for all else.

	HVAC size GCI 7.7	Size heating and cooling equipment in accordance with the Air Conditioning Contractors of America Manual, Parts J and S, ASHRAE handbooks, or equivalent software.	Mandatory
	Water heater GCI 7.8	Install hot water heater in rooms with drain or catch pan with drain piped to the exterior of the dwelling and with non-water sensitive floor coverings.	Mandatory
	Wet areas GCI 7.9	If using any form of grouted material in or around shower enclosures, use backing materials such as cement board, fiber cement board or equivalent (i.e., not paper-faced).	Mandatory
	Basements GCI 7.10a	Provide vapor barrier under all slabs. For concrete floors either in basements or on-grade slab install a capillary break of 4 four inches of gravel over soil. Cover all gravel with 6 millimeter polyethylene sheeting moisture barrier with joints lapped one foot or more. On interior below grade walls, avoid using separate vapor barrier or below grade vertical insulation.	Mandatory
	Below slab insulation	Use r10 or better, rigid foam board (expanded polystyrene or other high density foam board) insulation, above 4" of ¾" gravel (capillary break), and directly under the new slab. Tightly but all seams and seal with tape if seams are not being overlapped by two layers, Use extruded polystyrene rigid insulation as a bond break where slab meets foundation wall.	
	Radon GCI 7.10b	Install passive radon-resistant features below the slab along with a vertical vent pipe with junction box available, if an active system should prove necessary. For substantial rehab, introduce radon-reduction measures if elevated levels of radon are detected. See epa link for greater install detail: <a href="http://www.epa.gov/radon/rrnc/basic_techniques_builder.html">http://www.epa.gov/radon/rrnc/basic_techniques_builder.html</a>	Mandatory
	Water drainage GCI 7.11	Provide drainage of water to the lowest level of concrete away from windows, walls and foundations. Ensure concetete pitches toward a drain and/or away from house. Ensure siding has adequate control layers and drainage plane behind it.	Mandatory

	Garage isolation GCI 7.12	Provide a continuous air barrier between the conditioned (living) space and any unconditioned garage space. In single-family houses with attached garages, install a CO alarm inside the house on the wall that is attached to the garage and outside the sleeping area, and do not install air handling equipment in the garage.	Mandatory
	Vent dryer GCI 7.13	Clothes dryers must be exhausted directly to the outdoors using 4" rigid duct, in as straight a shot as possible, with minimal elbows. Clamp to dryer connection if dryer is provided. Seal exterior penetration point on inside and outside. No screws are to be used to connect dryer duct venting.	Mandatory
	IPM GCI 7.14	Seal all wall, floor and joint penetrations with low VOC caulking. Provide rodent-proof and corrosion-proof screens (e.g., copper or stainless steel mesh) for large openings.	Mandatory
	Lead safe GCI 7.15	For properties built before 1978, use EPA lead-safe work practices during renovation, remodeling, painting and demolition.	Mandatory
	Healthy flooring GCI 7.16	Use non-vinyl, non-carpet floor coverings in all rooms.	5 points

Spec #	Spec Title	Spec Description	Requirement Status
5567	PREP & PAINT VACANT ROOM w/ PAINTED TRIM—LOW VOC--GCI	<p>Using EPA standard lead safe work practices remove &amp; dispose of all loose material &amp; dust prior to installation of new materials. All cracked or loose plaster is to be repaired with a bedding coat of Durabond &amp; fiberglass mesh tape. If plaster &amp; lath boards are loose, re-secure or remove &amp; replace with drywall patch.</p> <p>CEILINGS &amp; WALLS: Prime as necessary to seal stains, raw plaster, etc. Paint ceilings two coats in FLAT CEILING WHITE &amp; walls in EGGSHELL OR SATIN finish cut-in neatly to trim &amp; at all corners &amp; edges.</p> <p>TRIM &amp; DOORS: Prep by de-glossing painted trim prior to finish painting. Apply two coats LATEX SEMI-GLOSS paint to cover completely &amp; uniformly. PAINTS: Use Sherwin-Williams or approved best grade paints and primers meeting the Green Seal G-11 Environmental Standard <a href="http://www.greenseal.org/certification/standards/paints.cfm">http://www.greenseal.org/certification/standards/paints.cfm</a>. Adhesives must comply with Rule 1168 of the South Coast Air Quality Management District - <a href="http://www.aqmd.gov/rules/reg/req11/r1168.pdf">http://www.aqmd.gov/rules/reg/req11/r1168.pdf</a>. All caulks and sealants must comply with regulation 8, rule 51, of the Bay Area Air Quality Management District <a href="http://www.baaqmd.gov/dst/regulations/rq0851.pdf">http://www.baaqmd.gov/dst/regulations/rq0851.pdf</a>. COLOR(S): Wall color selected by CM. Trim to be WHITE unless otherwise specified.</p>	
5610	VAPOR BARRIER PRIMER—LOW VOC--GCI	<p>Use EPA standard lead safe work practices. CEILINGS &amp; 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 <a href="http://www.greenseal.org/certification/standards/paints.cfm">http://www.greenseal.org/certification/standards/paints.cfm</a>.</p>	

Spec #	Spec Title	Spec Description	Requirement Status
5677	PREP & PAINT EXTERIOR TRIM—LOW VOC--GCI	<p>Use EPA standard lead safe work practices. 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 <a href="http://www.greenseal.org/certification/standards/paints.cfm">http://www.greenseal.org/certification/standards/paints.cfm</a>.</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 <a href="http://www.baaqmd.gov/dst/regulations/rq0851.pdf">http://www.baaqmd.gov/dst/regulations/rq0851.pdf</a>. Match existing color as close as possible. All work to be done in a neat &amp; professional manner. Use care to protect all surfaces not intended for paint coverage.</p>	
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 <a href="http://www.baaqmd.gov/dst/regulations/rq0851.pdf">http://www.baaqmd.gov/dst/regulations/rq0851.pdf</a> 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>	

## Carpet & Pad

Spec #	Spec Title	Spec Description	Requirement Status
5971	CARPET (BERBER) & PAD--GREEN LABEL--GCI	Install FHA approved, Nylon/Olefin blend Berber weave carpet. Install over a matched 1/2" 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.	
5972	CARPET (CUT PILE) & PAD--GREEN LABEL--GCI	Install FHA approved, Nylon/Olefin blend cut pile weave carpet. Install over a matched 1/2" 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.	

## Kitchen Cabinets

Spec #	Spec Title	Spec Description	Requirement status
3716	CABINET - WOOD BASE— PLYWOOD--GCI	Install base cabinets constructed of solid hardwood face-frames, doors and draw fronts with 1/2" 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.	

Spec #	Spec Title	Spec Description	Requirement Status
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 crown molding, OR c) will be 36" with a trimmed drywall or plywood soffit. Install upper cabinets constructed of solid hardwood face-frames and doors with 1/2" 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.	
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.	
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 crown molding, 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.	

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.	

## Radon

Spec #	Spec Title	Spec Description	Requirement Status
2040	RADON— VENT CONCRETE 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 3/4 inch stone. Grade and tamp soil to provide solid base. Install the 3/4" 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.	
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.	

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 or Tyvek tape. 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>	
2043	RADON— MAKE PASSIVE SYSTEM ACTIVE	<p>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.</p>	

**Pest Control- IPM is listed under Healthy Living environments of GCI 7.14**

Spec #	Spec Title	Spec Description	Requirement Status
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 - <a href="http://www.doyourownpestcontrol.com">http://www.doyourownpestcontrol.com</a> 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.	Mandatory

**Ventilation**

Spec #	Spec Title	Spec Description	Requirement Status
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.	Mandatory for substantial renovation

<p>7819 (included earlier under Electrical)</p>	<p>FAN/LIGHT FIXTURE—ENERGY STAR—GCI</p>	<p>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 &amp; 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)  <a href="http://www.energyfederation.org/consumer/default.php/cPath/39_766_134">http://www.energyfederation.org/consumer/default.php/cPath/39_766_134</a> ) 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 with a vapor barrier sleeve. Repair any damage to the ceiling installation and air seal fan/light assembly to the ceiling and at the exit point (enclosure penetration) with low VOC caulk.</p>	
<p>7821</p>	<p>FAN/LIGHT FIXTURE—ENERGY STAR—CONTINUOUS WITH MOTION ACTIVATED BOOST--GCI</p>	<p>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.</p>	

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) <a href="http://www.energyfederation.org/consumer/default.php/cPath/39_766_134">http://www.energyfederation.org/consumer/default.php/cPath/39_766_134</a> ) 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.	
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. <a href="http://www.aprilaire.com">http://www.aprilaire.com</a>	

Spec #	Spec Title	Spec Description	Requirement Status
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. <a href="http://www.skuttle.com/216.html">http://www.skuttle.com/216.html</a>	
6003	PASSIVE FRESH AIR INTAKE--GCI	Install a Tamarack passive intake vent ( <a href="http://www.efi.org">www.efi.org</a> ) 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.	
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 or tyvec tape. 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.	

4727	ROOF VENTILATION -- SOFFIT AND RIDGE	Install 1 SF of combined Soffit and Ridge ventilation for every 600 SF of attic floor area. Ventilation area should be split equally between the ridge and the eave. All vents must be screened and if exposed must be factory painted.	
	Roof Non-vented assembly	Spray foam directly against the roof deck, filling the cavity (and in some cases beyond) to necessary R value (code or better). Create a continuous air and thermal control layer, in full alignment from top to bottom.	
	Roof insulation	R 10 (or greater), Rigid foam insulation on exterior boundary of roof deck with offset joints in osb or plywood nail base (on top of foam). Off-setting joints is critical as part of the air control layer. This roof assembly involves no attic or roof vents. In this assembly, due point temperature rises at the first layer of roof sheathing, increasing roof durability. .	
	Non-vented attic with vented roof deck.	Create an air sealed, non-vented attic assembly, with rigid foam (R 10 or better) exterior roof sheathing on top of the first layer of original roof decking. Ice and water shield/roof wrap over top of foam, install furring strips (16 or 24 on center depending on interior rafter spacing), install screening or venting net at the bottom of the pathways, and install new roof deck over top. Then roof to code (felt, shingle, ridge cap). This creates a vented roof deck, with the least possible chance of ice dams, and a sealed attic, with the least amount of heat loss.	

## Water, Moisture and Mold Management

Spec #	Spec Title	Spec Description	Requirement Status
	Energy Efficiency Insulate	Insulate all hot water lines	
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.	
5416	TILE BACKER BOARD-- CEMENTITIOUS- -GCI	Install 1/2" fiberglass reinforced cement composition boards such as Durock® or HardieBacker™ in area specified to accept ceramic tile. Space edges 1/4" from adjoining surfaces and fasten with minimum 1-1/4" 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 1/4' 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 3/4' plywood over joists 16" on center or the joist/subfloor assembly must meet the manufacturer's specifications.	

Spec #	Spec Title	Spec Description	Requirement Status
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 3/4" 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. Include plastic reinforcing fibers in the mix. 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.	
	Basement, below slab insulation	Tightly install layer (or layers) of expanded polystyrene rigid insulation or high density mineral fiberboard below the new concrete slab. (Reclaimed material ok to use). Install directly above the stone layer, and directly below the slab. If plastic is necessary due to older code language or for added air sealing (potentially for sake of radon), install plastic over top of rigid foam.	
	Control Layers	Inspect and confirm exterior air control layer, water control layer, and vapor control layer are all in place prior to filling wall cavities with insulation.	
	Drainage plane	Install 3/4" furring strips over outer layer of properly lapped and taped house wrap, to provide a drainage plane, and an air space behind siding. (Not necessary for vinyl siding locations).	
2567	SIDING--HARDIPLANK--GCI	Prepare surface by removing nails, repairing sheathing, applying house-wrap and Hardiplank siding <b>strictly to manufacturer's specifications</b> . Install 8" 1/4" 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. install joints with a 3 mm gap filled with Hardiplank caulking compound and install a piece of Hardiplank approved felt sheeting 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.	

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.	
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