



CONCRETE INSTALLERS

Be a Built Green® Specialty Contractor! By offering the following options with your service, you'll add value for your customers and help build greener homes. Environmentally-minded homeowners will be pleased that you take special care with their project, and Built Green® Builders, Remodelers and Developers will know that in addition to your service, you'll be guaranteeing Built Green® points.

Here are some action items in the Tri-Cities Built Green® Checklist that will win Built Green® points and are easy to accomplish.

Planning

Action Item	Checklist Reference	Points Available
<p>Use flyash in concrete for foundation Flyash, a by-product of burning coal for electricity production, can be added to concrete slabs and foundation mixes as a substitute for up to 60% of the Portland cement content. Ask your concrete vendor to include 15-30% until you're used to working with it. It has been shown to improve the strength of concrete as well as increase its workability and drying times.</p>	5-37	1
<p>Use recycled concrete, asphalt, or glass cullet for base or fill for foundation Make sure concrete, asphalt, or glass cullet is ground properly to meet base or fill specification. When ground to specs, the materials compact nicely to form a stable base. Get a sample from the supplier for approval.</p>	5-38	2-4
<p>Use airtight building method, such as structural insulated panels (SIP) or insulated concrete forms (ICF), for building envelope and fix potential leak areas along ceiling and in attic Insulating concrete forms (ICFs) are rigid plastic foam forms that hold concrete in place during curing and remain in place afterwards to serve as thermal insulation for concrete walls. ICFs are used to make structural concrete walls, and can be used to make either foundation or above-grade walls. ICF walls provide R-values between R-14 and R-23 and lower air infiltration rates when compared to typical wood frame construction.</p>	3-15	5-7
<p>Use concrete slab or sub-floor as finished floor in living space If you have already poured a concrete slab or sub-floor, the embodied energy of this material has already been incorporated into the project. Consider using this as a finished floor for a very durable and stylish look while greatly minimizing additional material use.</p>	5-48	2
<p>Design to reduce effective impervious surface to 0% or equivalent A site is 0% impervious, if all rainwater is captured and infiltrated on site. Strategies to reduce impervious surfaces include: adding structures above existing ones, installing landscapes which detain stormwater, removing paved walkways, drives, or other impervious surfaces and replacing them with pervious surfaces, and replacing a conventional roof with a vegetated roof.</p>	2-16	4
<p>Use pervious materials for a percentage of the total area for driveways, walkways, and patios Pervious paving materials help to maintain the water hydrology of the site. Pervious pavement replacement is simplified, and expensive measures such as asphalt cutting for underground repairs are eliminated.</p>	2-17	1-5

On-Site

Action Item	Checklist Reference	Points Available
<p>Use reusable forms, including wood if it is well maintained Use forms made from steel or aluminum for concrete pours. These forms are readily available. Besides providing a better finish, metal forms help to prevent unnecessary wood waste. Dimensional lumber can be used for smaller scale projects, and if carefully maintained, can provide adequate finish quality and can be reused many times. Typically after their last use, wood forms can be reused in building projects for non-structural applications.</p>	5-14	2
<p>Use a biodiesel mix in on-site equipment and/or vehicles Biodiesel is a renewable fuel made from a mixture of alcohol and vegetable or animal oils. Incorporating biodiesel into the fuel mix reduces particulate matter, toxins, and carbon monoxide emitted from engines. Biodiesel reduces the amount of petroleum, a non-renewable fuel, thereby reducing the risk of harming sensitive environments during extraction and transportation. Biodiesel works well in construction equipment and in all diesel cars. However, biodiesel has a higher alcohol content and acts as a solvent. Before using biodiesel, ensure that all equipment/engine hoses are made of synthetic rubber. New equipment run on biodiesel will not have fuel line or filter issues.</p>	2-52	1-4
<p>Use less toxic form releasers Forms are commonly coated with fuel oil to prevent the concrete from sticking to the form. Runoff, incidental drips, and spills contaminate soils and may enter storm drains thereby contaminating surface water. Use less toxic form releasers or strategies, such as “kick-hard,” vegetable oil spray, or waxing or painting the forms prior to use.</p>	2-23	2
<p>Wash out concrete trucks in slab or pavement subbase areas or storage containers Over the life of a project one to three yards of concrete slurry and lime can be generated from washing out concrete trucks. Wash out concrete trucks and pumps in slab or pavement subbase areas, such as driveways, where slurry can be contained and will be useful. Find out if your concrete supplier uses truck mounted or plant based wash out systems. These systems allow for the capture of all concrete residues.</p>	2-20	1-3
<p>Achieve 85% minimum recycling rate for at least two of the following products: cardboard, metal scraps, wood/pallet scraps, packaging & pallet wrap, drywall, concrete, asphalt rubble, rock, brick, paint, asphalt roofing, land clearing, yard waste, and soil, glass, carpet padding, and upholstery foam Concrete, brick, asphalt rubble, and other building materials can be collected on site and recycled for less money than it costs to be landfilled.</p>	5-17	1-15
<p>Total points possible for fulfilling all action items</p>		49

As a trade contractor, you can become a Built Green® Program Associate. For information on how to join the program, or if you have other questions, contact the Home Builders Association of Tri-Cities (HBA). Office Phone 509-735-2745, Email bsd@hbatc.com, or visit www.hbatc.com/builtgreen.



DRYWALL CONTRACTORS

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Planning

Action Item	Checklist Reference	Points Available
<p>Use suppliers who offer and take back reusable and recyclable packaging Cardboard, plastic shrink wrap, kraft paper, wood pallets or frames, and metal bands are just some of the packaging materials that can show up on your jobsite. They comprise a significant portion of the typical construction waste stream, and add to your project cost. Encourage suppliers and manufacturers to take responsibility for their packaging. Other actions you can take include requesting minimal packaging when placing a materials order, selecting products that are delivered with minimal, reusable, or recyclable packaging and purchasing materials like fasteners, paints, caulking, and drywall mud in bulk containers.</p>	5-4	1
<p>Use drywall with recycled-content gypsum and/or use recycled or "reworked" paint and finishes Drywall manufactured with recycled gypsum is commonly available at most building material suppliers and is cost-competitive with conventional drywall. However, it must be specified if you want to use it, so address the recycled gypsum content of drywall with your supplier, before you order.</p>	5-50	1-2
<p>Keep materials dry during construction and conduct a moisture test prior to close-in of walls and conditioned space; verify 15% or less Keep your materials dry prior to installation. Do not install drywall if framing has moisture content above 15%.</p>	4-5	1-3
<p>Use airtight drywall approach for framed structures The airtight drywall approach (ADA) for framed structures is an advanced sealing package that goes beyond basic practice. It includes caulk or gasket drywall installed on exterior walls at the top and bottom plates, windows and doorframes; caulk or gasket drywall installed on interior walls at intersections with exterior ceilings; and caulk or gasket electrical, plumbing, or mechanical penetrations in the drywall. Use good quality, durable materials for sealing and use the proper type of sealing material for the size of gap.</p>	3-7	3

On-Site

Action Item	Checklist Reference	Points Available
<p>Reuse building materials for your job and/or use reclaimed building materials when appropriate</p> <p>Reusing materials can reduce project cost by avoiding disposal fees and reducing the need to purchase new materials. To make reuse easier in temporary structures, apply methods such as fastening with screws rather than nails to make dismantling convenient. If you have the storage space available, you may be able to store used materials for future projects.</p> <p>When reusing structural materials, check with your local building authority regarding strength reductions or limits.</p>	5-15	1-11
<p>If garage is attached, air-seal it from occupied space using Energy Star® sealing standard</p> <p>Use the Airtight Drywall Approach (ADA) in the walls and ceiling shared by the house and garage. ADA is an advanced sealing package that goes beyond basic practice. Other best practices include: Use caulk or foam to seal all holes in walls and the ceiling between the house and garage. Make sure that the door between the house and garage is weather-stripped and is fitted with a threshold that creates a tight seal with the door. For additional reference, see the Energy Star® Residential New Construction Field Guide detailed information sealing methods.</p>	4-23	3
<p>Total points possible for fulfilling all action items</p>		23

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ELECTRICAL AND LIGHTING CONTRACTORS

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<p>Furnish eight energy star® compact fluorescent light bulbs to owners</p> <p>Compact fluorescent lights (CFL) have a higher first cost but advanced technology enables CFLs to use 75% less energy than a standard incandescent bulb and last up to 10 times longer. Newer, smaller CFL screw-in bulbs can be substituted in most applications, and in high use areas like the kitchen, outdoor/porch and other high-use rooms can save substantial energy. Many new styles and high quality light make these a choice with lasting benefits.</p>	3-61	1

On-Site

Action Item	Checklist Reference	Points Available
<p>Install at least one energy star® ceiling fan in rooms with ceiling heights greater than 8 feet</p> <p>Provide wiring and switching needed for two or more ceiling fans in the electrical plan. If installed, a ceiling fan can be used as a low-energy option to provide cooling on hot days.</p>	3-26	1
<p>Substitute all incandescent down lights for CFL downlights (recessed cans) or LEDs</p> <p>Compact fluorescent light bulbs, or CFLs, are an alternative to incandescent which use less power and have a longer rated life. LED lamps are the most energy efficient option for lighting; but they are also currently the most expensive. Also called LED bars or illuminators, they are usually clusters of small LED bulbs in a suitable housing.</p>	3-60	1-2

<p>Install motion detectors on exterior lights Light-sensing controls are increasingly being used to control outdoor lights along driveways and walkways. Consider motion detectors and photo sensors for energy efficiency. Consult with your lighting supplier for optimal placement.</p>	<p>3-62</p>	<p>1</p>
<p>Install lighting timers, and/or motion detectors on interior lights Dimmers allow you to use one light for many purposes, and can save energy and extend the life of most bulbs when used at lower levels. Dimmers can be used with incandescent lights, including low voltage systems, and with compact fluorescents. Timers can be located at a light switch, a plug, or in a socket, and are available as both mechanical and solid-state. Motion detectors or occupancy sensors can result in significant energy savings, especially in bathrooms and bedrooms where lights are frequently left on.</p>	<p>3-63</p>	<p>1</p>
<p>Total points possible for fulfilling all action items</p>		<p>7</p>

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APPLIANCE SUPPLIERS

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Action Item	Checklist Reference	Points Available
<p>Install an outdoor clothesline A permanent clothesline can save energy and help reduce air pollution by reducing use of the clothes dryer. Using only a clothesline, instead of electric or gas dryer, saves an average of 1,000 kWh of electricity a year. Note: indoor clotheslines should only be used if the potential moisture issues are adequately addressed.</p>	3-51	1
<p>Install an Energy Star® washing machine ENERGY STAR® certified clothes washers offer significant water and energy efficiencies (up to 30% less) compared to non-certified. Clothes at the end of the wash cycle contain less water compared to conventional washers due to higher spin speeds. Finally, Horizontal-axis (H-axis) washers generally use less water per wash, and are gentler on clothes so they last longer. All these benefits are features you can “sell” to your clients.</p>	3-52	1-2
<p>Install an Energy Star® dishwasher The most water-efficient dishwashers use as little as 3.9 gallons per cycle at the economy setting. Energy savings range from 80 kWh per year to 364 kWh per year. Market your selection of an extra-efficient dishwasher to the homeowner from several perspectives—performance, water and energy efficiency, ease of use, total features, quiet operation, and reliability.</p>	3-53	1
<p>Install an Energy Star® refrigerator ENERGY STAR® refrigerators listed are at least 20% more efficient than the current federal minimum standard. Energy savings range from 125 kWh per year to 320 kWh per year, depending on size, style, and features.</p>	3-54	1
<p>Install an Energy Star® appliance suite (clothes washer, dishwasher, and refrigerator) By bundling together suites of ENERGY STAR® appliances, you can aggregate the energy and performance benefits and market homeowners’ interest in quality, efficiency and value for their money. (This action item replaces point credits 3-52, 3-53 and 3-54)</p>	3-55	5
<p>Total points possible for fulfilling all action items</p>		10

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FRAMING CONTRACTORS

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<p>Reuse building materials for your job and/or use reclaimed building materials when appropriate</p> <p>Reusing materials can reduce project cost by avoiding disposal fees and reducing the need to purchase new materials. To make reuse easier in temporary structures, apply methods such as fastening with screws rather than nails to make dismantling convenient. If you have the storage space available, you may be able to store used materials for future projects.</p> <p>When reusing structural materials, check with your local building authority regarding strength reductions or limits.</p>	5-15	1-11
<p>Use finger-jointed framing material (e.g. risers and studs; longitudinal compression loads only)</p> <p>Finger-jointing or engineered studs (gluing short lengths of wood together) makes use of wood that traditionally would have been disposed of as waste. Finger-jointed products are generally straighter and stronger than solid wood; you won't have to reject and waste warped or split boards. For structural use, they are acceptable for longitudinal compression loads only.</p>	5-34	3
<p>Use wood products certified as sustainably produced by a recognized third party</p> <p>Order lumber that is certified by Forest Stewardship Council (FSC), CSA International, Sustainable Forestry Initiative (SFI) or the American Tree Farms system. Certified lumber is becoming more available. Cost premiums can be offset by using advanced framing techniques. Refer to the Built Green® Resource Handbook for more information.</p>	5-24	1-3

Action Item	Checklist Reference	Points Available
<p>Use 50-year warranted siding product Minimizing the need to replace any siding product offers a maximum consumer benefit to the homeowner, in addition to the obvious environmental impact. Many of the fiber-cement composites offer a 50-year warranty. Ask your local supplier for this and other options.</p>	5-58	2
<p>Use insulated headers Using insulated headers achieve higher R-values than standard headers without sacrificing structural integrity. They can be purchased pre-assembled, or built on-site by sandwiching rigid insulation between the lumber.</p>	3-10	1
<p>Where applicable, use 2-stud instead of 3-stud corners, and fully insulate corners Corner construction using two instead of three studs leaves space for additional insulation. Drywall clips, spaced two feet apart, provide back-up for interior finish materials, where one wall abuts another, or where two walls intersect.</p>	3-11	1
<p>Fully insulated interior/exterior wall intersections Optional framing details, such as flat-stud intersections, one-stud intersections and ladder-blocked intersections ease placement of insulation and save lumber.</p>	3-12	1
<p>Use advanced wall framing – 24-in OC, with double top plate Advanced Wall Framing is a code-recognized process that incorporates 24-inch on-center framing with increased insulation. On average, the complete advanced framing system uses 30% less lumber, takes less time to construct, and costs less to build.</p>	3-16	3
<p>Use insulated exterior sheathing (r-7 minimum) in conjunction with R-21 wall insulation The use of insulated exterior sheathing eliminates all of the thermal bridging created by framing. In many cases the use of exterior sheathing may allow the builder to use 2X4 instead of 2X6 framing, thus reducing lumber use and cost. Insulated exterior sheathing can reduce condensation in walls because the wall stays warmer. Exterior insulated sheathing when properly detailed can provide a superior exterior water management system.</p>	3-14	4

On-Site

Action Item	Checklist Reference	Points Available
<p>Keep materials dry during construction and conduct a moisture test prior to close-in of walls and conditioned space; verify 15% or less Keep your materials dry prior to installation. Do not install drywall if framing has moisture content above 15%. Keep your materials dry during transportation and storage. Do not install insulation and drywall if framing has moisture content above 15%. Dry out with dehumidifier; combustion heaters bring moisture into the structure.</p>	4-5	1-3
<p>Create detailed take-off and materials list for use by framers Having a list identifying the intended location of each piece of lumber reduces the overall volume of lumber needed to construct the house as well as the volume of leftover cut unintentionally. Create a board-by-board take-off that can be used as a cut list for framers and an order list for your supplier. This list increases accountability of framers and suppliers and can result in significant savings.</p>	5-5	2

<p>Sell or donate wood scraps, lumber, or land clearing debris for re-use Sell or give away logs not used as timber, or wood scraps that are less than one foot long since they are unlikely to be reused on the job. Recycle whatever is left at the end of the project.</p>	<p>5-12</p>	<p>1</p>
<p>Manage construction dust within building envelope during construction Clean/vacuum up dirt, dust, and wood shavings as you go. Vacuum stud bays before installing insulation and drywall. Avoid using HVAC system during construction to void potential contamination of the system.</p>	<p>4-6</p>	<p>2</p>
<p>Use central cutting area or cut packs Designating a centralized cutting area reduces the total amount of wood that is needed for a project by reducing wood waste (by up to 15%), and increasing reuse of cutoffs. It also makes the cutting process itself more efficient. Cut packs reduce on-site waste since they are pre-measured and cut offsite.</p>	<p>5-6</p>	<p>2</p>
<p>Total points possible for fulfilling all action items</p>		<p>40</p>



INSULATION CONTRACTORS

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Planning

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<p>Use recycled-content (minimum of 40%) insulation</p> <p>There are three commonly available types of recycled content insulation:</p> <ul style="list-style-type: none"> • <i>Cellulose insulation</i> is made from 100% post-consumer recycled newspapers or telephone books. The insulation can be dry-blown or poured loose-fill into enclosed cavities, but is most commonly wet-sprayed. • Several brands of <i>fiberglass insulation batts</i> are manufactured using recycled glass, including post-consumer glass collected in curbside recycling programs. • <i>Mineral wool insulation</i> is another option and is available in loose-fill or batts. It has, on average, 75% post-industrial recycled-content. 	5-75	2

<p>Use environmentally friendly foam building products (urea-formaldehyde-, CFC-, and HCFC-free)</p> <p>CFCs contribute significantly to ozone depletion and global warming, two of our most serious environmental concerns. HCFCs are less damaging than CFCs, but should also be avoided if at all possible. In addition, avoid products that include urea-formaldehyde, because indoor formaldehyde is gaining recognition as a health hazard causing severe reactions in individuals that become sensitized through exposure.</p> <p>Options to consider include:</p> <ul style="list-style-type: none"> • Beadboard or EPS (expanded polystyrene) rigid foam insulation has an insulating value of (R-3.6 to R-4.4 per inch) and can be used for interior or below grade uses. It is less damaging to the environment because pentane is used in its production rather than HCFC. • Polyurethane insulation (e.g. polyisocyanurate) made with pentane instead of HCFCs as the blowing agent is now available. However, unlike EPS, there are few outlets for polyurethane foam as a recycled product. • Blown-in cellulose (100% recycled newspaper content) or urea-formaldehyde-free fiberglass. • Soy, cotton, denim, or foam 	5-76	4
<p>Use urea-formaldehyde-free insulation or greenguard certified product</p> <p>Standard fiberglass batt insulation, the most common for new houses, has up to 14% urea-formaldehyde, which can contribute to poor indoor air quality. Look for formaldehyde-free fiberglass insulation, preferably one with recycled content. If you use rigid insulation, make sure it is urea-formaldehyde-free, CFC-free, and HCFC-free. CFCs and HCFCs are not an indoor air quality problem, but should be avoided because they are believed to cause deterioration of the earth's ozone layer, certainly a general threat to the environment and human safety.</p>	4-24	3

On-Site

Action Item	Checklist Reference	Points Available
<p>Where applicable, use 2-stud instead of 3-stud corners, and fully insulate corners</p> <p>Corner construction using two, instead of three studs leaves space for additional insulation. Ensure that you insulate right into the corner behind the stud.</p>	3-11	1
<p>Fully insulate at interior/exterior wall intersections</p> <p>Flat-stud intersections, one-stud intersections and ladder-blocked intersections provide for easy insulation placement. Ensure that you fully insulate at the intersection.</p>	3-12	1
<p>Keep materials dry during construction and conduct a moisture test prior to close-in of walls and conditioned space; verify 15% or less</p> <p>Keep your materials dry prior to installation. Do not install drywall if framing has moisture content above 15%.</p>	4-5	1-3
<p>Total points possible for fulfilling all action items</p>		15

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ROOFING CONTRACTORS

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<p>Use recycled-content roofing material</p> <p>Several new composite options are available that provide lower maintenance along with durability. Many of these options include recycled-content or reclaimed materials: fiber-cement composites, asphalt shingles, plastic shakes, and rigid sheet material made with fiber and asphalt, and metal shingles. In general, look to achieve a minimum of 25% recycled content.</p>	5-72	2
<p>Use 40- or 50-year warranted roofing material</p> <p>Using durable materials with long-lasting value helps prevent the need for replacement – an asset to the homeowner – which add to the value of any home. Varieties of organic felt-based shingles are available with up to 40-year warranties. Some brands of aluminum or steel shingles have a 50-year limited warranty and in addition, come with a coating approved by HUD, which allows the roof to be used for collecting rainwater. Fiberboard shakes, a durable product that can be nailed and sawn similar to wood shakes, generally come with a 30 to 50 year warranty.</p>	5-73	2-3

On-Site

Action Item	Checklist Reference	Points Available
<p>Pitch and flash roofs properly All roof penetrations must be properly flashed. Check to make sure roofs are pitched at least 3-in-12, and eaves extend out far enough to keep water off windows.</p>	4-37	1
<p>Achieve 85% minimum recycling rate for at least two of the following products: cardboard, metal scraps, wood/pallet scraps, packaging & pallet wrap, drywall, concrete, asphalt rubble, rock, brick, paint, asphalt roofing, land clearing, yard waste, and soil Concrete, brick, asphalt rubble, and other building materials can be collected on site and recycled for less money than it costs to be landfilled.</p>	5-17	1-15
<p>Total points for fulfilling all action items</p>		22

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MECHANICAL/HVAC CONTRACTORS

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<p>Install energy star® (or equivalent) or better heating equipment</p> <p>By selecting ENERGY STAR® rated heating equipment you are assured of significant energy savings. The ENERGY STAR® standard for heating equipment includes 90% Annual Fuel Utilization Efficiency (AFUE) furnaces. The AFUE measures the amount of heat actually delivered to your house compared to the quantity of fuel supplied to your furnace. If a furnace has an 80% AFUE rating, 80% is converted to fuel heat while the rest is lost out the chimney.</p>	3-27	2-4
<p>Insulate any ducts located in unconditioned space to at least R-11</p> <p>Uninsulated ducts in the crawl space can increase energy use and lead to excess moisture in the crawl space. Attic ductwork can also reduce energy efficiency through heat loss and should also be insulated.</p>	3-28	2
<p>Seal ducts in accordance with energy star® requirements</p> <p>Efficiency of the heating distribution system can be improved by 15% if the ducts located in the crawlspace or attic are well-sealed. Use fittings with gaskets, or seal with mastic. Aerosol sealing seals ducts from the inside.</p>	3-32	1
<p>Locate air handler and distribution system inside conditioned envelope</p> <p>A heating system's efficiency can be improved by 30% or better if the entire heating system is located within the heated space. Make sure the system is sized accordingly. Carefully planned hydronic systems or in-space heating systems will also provide these benefits.</p>	3-34	2-5

Action Item	Checklist Reference	Points Available
<p>Install programmable thermostats with nighttime setback, switch for furnace fan, and 7-day settings (no setback required for radiant mass construction) EPA estimates that ENERGY STAR®-labeled programmable thermostats, when used properly, can save consumers 20-30% on heating and cooling bills.</p>	3-40	2
<p>Verify performance of ventilation systems; measuring supply and exhaust airflow, checking control activation and damper operation. Commission the air-to-air heat exchanger, if installed This Action Item verifies proper operation of ventilation systems by measuring the air flow of all supply and exhaust systems using a flow hood. Also check controls for proper activation. Check mechanical damper operation, if applicable</p>	4-43	3-5
<p>Install medium efficiency pleated filter MERV 10, high efficiency MERV 12 or better, or HEPA filter The higher the efficiency, the better the filtration system is at capturing and removing small particles from the air. A HEPA (High Efficiency Particle Air) Filtration System is 99.97% efficient at removing particles of 0.03 microns.</p>	4-44	3-5
<p>Install central vacuum, bonus if exhausted to outside Central vacuum systems efficiently remove dirt without stirring up microscopic dust particles inside the home. Locate it in the garage, and exhaust it to outside.</p>	4-46	2-4
<p>Right-size central air conditioner (if using AC) or ground source heat pump, with an equipment matched SEER/EER level (as determined by an ARI coil/condenser equipment match and a thermal expansion valve (TXV)). Maximum over-sizing of units is <15% of manual J By limiting the size of space conditioning equipment, you avoid excessive equipment cycling, which reduces energy efficiency and service life and increases maintenance requirements. It also insures that the run cycle is long enough to condition air, remove moisture, and filter air.</p>	3-38	2-10
<p>Provide balanced indoor pressure using controlled ventilation In a tight house, balanced ventilation keeps outdoor pollutants from being drawn into the house, prevents backdrafting or spillage from combustion appliances (due to under-pressurization), and prevents moisture migration into structural cavities (due to over-pressurization). Ducted fans or a heat recovery ventilator may be used to balance exhaust ventilation de-pressurization or provide a slight positive pressure with a modest volume of fresh air. The volume of air supplied should be provided as specified in the Washington State Ventilation and Indoor Air Quality Code.</p>	4-54	5
<p>Use ductless distribution system (e.g. Hydronic, radiant, ductless mini-splits) Air leakage in forced-air heating systems frequently impacts indoor air quality. Duct leaks bring air into the home from undesirable locations, such as attics, crawl spaces, and the garage. Duct leaks can also induce combustion equipment backdrafting. These impacts can be reduced by thoroughly sealing the ductwork with mastic. These problems will not exist at all if a ductless heating system is used, such as a ductless electric heat pump, radiant floor or baseboard system.</p>	3-35	10

On-Site

Action Item	Checklist Reference	Points Available
<p>Achieve 85% minimum recycling rate for at least two of the following products: cardboard, metal scraps, wood/pallet scraps, packaging & pallet wrap, drywall, concrete, asphalt rubble, rock, brick, paint, asphalt roofing, land clearing, yard waste, and soil</p> <p>Metal scrap, cardboard and other packaging can easily be recycled. Many Built Green™ builders will require you to participate in waste reduction and recycling efforts.</p>	5-17	1-15
<p>Total points for fulfilling all action items (some items are either/or)</p>		69

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PAINTING CONTRACTORS

Be a Built Green® Specialty Contractor! By offering the following options with your service, you'll add value for your customers and help build greener homes. Environmentally-minded homeowners will be pleased that you take special care with their project, and Built Green® Builders, Remodelers and Developers will know that in addition to your service, you'll be guaranteeing Built Green® points.

Here are some action items in the Tri-Cities Built Green® Checklist that will win Built Green® points and are easy to accomplish.

Planning

Action Item	Checklist Reference	Points Available
<p>Use suppliers who offer and take back reusable and recyclable packaging</p> <p>Packaging makes up a significant portion of the waste generated on site. Many Built Green™ builders will require you to participate in their waste minimization and recycling programs; by asking your suppliers to take back packaging, you'll save yourself time and money.</p>	5-4	1
<p>Use light-colored interior finishes on 80% of interior walls</p> <p>Light colored interior finishes naturally reflect both natural and artificial light, reducing the demand for additional artificial lighting.</p>	3-56	1
<p>Use recycled, low-or non-voc paint for large surface areas</p> <p>Solvent-based paints are traditionally considered the most durable, but they produce toxic emissions when curing and require the use of hazardous solvents for cleanup. In addition, they off-gas trace amounts of volatile gases (VOCs) during, and for months following application, which can cause upper respiratory irritation to painting crew and occupants.</p> <p>“Zero-VOC” or low-VOC water based paints are generally safer to handle, can be cleaned up with water, and produce little or no off-gassing. For most indoor applications, there is almost no difference in performance between solvent-based and water-based paints. Many low-VOC paints are comparable in price to conventional paint.</p>	4-33	1
<p>Use low- or non-voc, and non-toxic interior paints and finishes on all interior surfaces</p> <p>“Zero-VOC” or low-VOC water based paints are generally safer to handle, can be cleaned up with water, and produce little or no off-gassing. For most indoor applications, there is almost no difference in performance between solvent-based and water-based paints.</p>	4-33	1

On-Site

Action Item	Checklist Reference	Points Available
<p>Use low- or non-voc, and non-toxic interior paints and finishes on all interior surfaces</p> <p>“Zero-VOC” or low-VOC water based paints are generally safer to handle, can be cleaned up with water, and produce little or no off-gassing. For most indoor applications, there is almost no difference in performance between solvent-based and water-based paints.</p> <p>Low-toxic, clear sealers are also available to use as finishes for woodwork. Water-based varnishes, polyurethane, and other finishes for hardwood floors are very durable and much safer to handle than traditional products. Low or non-toxic solvents, water-based strippers, and all-natural thinners are also locally available.</p>	4-32	5
<p>Ventilate with fans after each new finish is applied</p> <p>Each new finish (for example, paints, stains, and floor finishes) will off-gas for a time after it is applied. It is important to ventilate the house with fans (several box fans in windows work best) so that gases will be exhausted outside. Venting out should continue for at least two and up to seven days after each application, depending on the amount of surface covered and the toxicity of the finish.</p> <p>If the house is not properly ventilated during this phase, the emitted gases will adhere to surfaces in the house and later re-released into the indoor environment. Use construction filters on HVAC system and change them out before occupancy.</p>	4-7 4-8	3
<p>Use drywall with recycled-content gypsum and/ or use recycled or “reworked” paint and finishes</p> <p>Your local paint supplier may carry recycled or reworked paints. Where available, there may be a fee based on the type of paint. Optimally, paint for recycling should be newer, clean of debris, and stored above freezing.</p>	5-50	1-2
<p>Total points for fulfilling all action items</p>		14

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PLUMBING CONTRACTORS

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Planning

Action Item	Checklist Reference	Points Available
<p>Use suppliers who offer and take back reusable and recyclable packaging Packaging makes up a significant portion of the waste generated on site. Many Built Green™ builders will require you to participate in their waste minimization and recycling programs; by asking your suppliers to take back packaging, you'll save yourself time and money.</p>	5-4	1
<p>Plumb for graywater irrigation Graywater is all wastewater generated in the house except from toilet flushing. Sometimes referred to as "reclaimed" or "recycled" water, this includes wastewater from laundries, showers, and sinks. Graywater can be collected and stored for reuse as a nutrient-rich irrigation source, which conserves water.</p>	2-36	5
<p>Install instant (tankless) hot water system The goal is to eliminate the loss of energy from hot water left standing in long pipe runs from water heater to point of use. On-Demand systems are located at the point of use and heat the water as it passes through; best for intermittent demands. A small, well-insulated tank heater can be installed at a remote point of use. "Home Run" hot plumbing uses a smaller diameter pipe to deliver hot water direct from water heater to a remote location.</p>	3-46	2
<p>Install electric water heater efficiency to EF of .93 or higher Upgrading electric water heater efficiency from an Energy Factor (EF) of .88 (code) to .93 will save 225 kWh per year. Household operational savings will support an additional cost of about \$50.</p>	3-47	2
<p>Install gas or propane water heater efficiency to EF of .61, .83, or .90 Upgrading gas water heater efficiency from an EF of .55 (code) to .60 will save 18 therms per year. Household operational savings will support an additional cost of about \$38. Upgrading a propane water heater from an EF of .55 (code) to .60 will save 16 gallons of propane per year. Household operational savings will support an additional cost of about \$50.</p>	3-48	1-5
<p>Install the water heater inside the heated space and conduct combustion area test (combustion test not needed for electric, direct vent, or sealed venting) Installing the water heater in the heated space reduces heat loss to the outside. Direct vent hot water heaters protect indoor air quality by venting combustion by-products outside and drawing combustion air from outside.</p>	3-49	2

Action Item	Checklist Reference	Points Available
<p>Install a solar water heating system to supply all or a percentage of the household water needs</p> <p>Solar energy can meet part or all of a home’s domestic hot water needs. Geographic location, system design, collector orientation, and collector size will determine how much energy can be provided for domestic hot water heating. A solar water heating system may result in immediate positive cash flow if the monthly cost of financing the system is less than the net savings.</p>	3-42	2-10
<p>Install drainwater heat recovery system (DHR)</p> <p>A significant amount of energy is lost when draining warm wastewater. Drainwater heat recovery (DHR) devices fit into existing drain lines to capture exiting energy to preheat cold water going to a shower or to a water heater. DHR systems reduce the energy needed to heat water and can increase the capacity of water heaters.</p>	3-50	2
<p>Eliminate PVC from water distribution system</p> <p>Some studies indicate that use of PVC plastics in the home is related to increased incidence of bronchial obstruction (asthma) in children (source: <i>American Journal of Public Health</i>. 1999;89:188&SHY;192). Also, in the event of a fire, PVC can release toxic smoke. If the water is slightly acidic or alkaline, copper plumbing can release copper ions into drinking water, which is potentially harmful to health. Instead, use polyethylene piping for plumbing.</p>	4-31	3

On-Site

Action Item	Checklist Reference	Points Available
<p>Insulate all hot water pipes This measure reduces standby heat loss from the water tank. The tank continuously heats the piping and the water in it even when no water is being used. They act as “cooling rods.” Insulating them reduces the rate of heat loss.</p>	<p>3-45</p>	<p>2</p>
<p>Recycle metal scraps Copper scraps have been recycled for years because the metal has a high market value. As other metals (steel, iron, aluminum) have increased in value, it has become more beneficial to recycle them as well. Metal can be collected or accepted for free, with higher value metals providing revenues. Rebates available for recycled metals vary with market value. Separated metals have a higher value than mixed metals. Some recyclers will pay for sorted metals. Check with recycler for their specifications.</p>	<p>5-4 5-18</p>	<p>5-7</p>
<p>Total points for fulfilling all action items</p>		<p>41</p>

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LANDCLEARING & EXCAVATION CONTRACTORS

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Planning

Action Item	Checklist Reference	Points Available
<p>If clearing or grading during winter months, take extra precautions to avoid runoff and tracking to protect critical areas</p> <p>Plan ahead with builder to avoid clearing and grading during the wettest part of the year - November through March. This is particularly important for soils that are easily eroded. To find out if the soils at your site qualify as "easily eroded," consult your local code official or go to the Soil Conservation Surveys (SCS) at your local library.</p>	2-25	2
<p>Implement comprehensive dust control plan</p> <p>Spreading out the grading process over phases can help reduce erosion.</p>	2-50	3

On-Site

Action Item	Checklist Reference	Points Available
<p>Preserve and protect existing native vegetation on-site to maintain its natural dust-suppression function</p> <p>Retaining native vegetation in a landscape (rather than removing and replanting) provides excellent erosion, sediment, dust, and pollution control.</p> <ul style="list-style-type: none"> • Review grading and preservation plan with builder to ensure compliance. • Respect critical area fences, such as tree root zones, to prevent damage. • Hand-clear understory if needed, to protect tree roots. • Never park heavy equipment or store heavy materials under trees. 	2-51	3
<p>Take extra precautions to protect trees during construction</p> <p>Keep all excavations, equipment and debris away from trees at a distance two times the size of the canopy from the tree trunk (dripline) when possible (this protects the root systems). Post signs on trees to be saved, clearly indicating the tree's monetary value (cost of replacement) – Some studies have found trees add as much as 30% to the selling price of unimproved lots</p>	2-5	3

Action Item	Checklist Reference	Points Available
<p>Exceed code requirements to preserve and protect critical areas during construction</p> <p>Protect wetlands from sediment using appropriate best management practices such as compost slope mulching and silt retention berms. Leave a vegetated buffer zone, a minimum of 100 feet wide on each side along streams or other water bodies unless approved plans indicate larger buffers are required. (Check with your local jurisdiction for buffer size requirements.)</p>	2-6	3
<p>Exceed code requirements to install temporary erosion control devices and optimally maintain them</p> <p>Erosion control BMPs minimize the loss of soil during construction. Installed BMPs must be maintained on a regular basis.</p> <ul style="list-style-type: none"> • Use compost barriers or berms, or silt control fencing at appropriate • Mulch exposed soils or use plastic sheeting. • Install temporary strawbale erosion and sedimentation control check dams in ditches during construction. • Inspect all erosion and sedimentation control measures immediately if more than ½” of rain falls in a 24 hour period. • Compost or hydroseed exposed areas as soon as possible. • Install stabilized construction entrance (quarry spall or crushed rock) 	2-9	2
<p>Use biodegradable slope stabilizing materials</p> <p>Research has shown that compost can often outperform conventional slope stabilization methods. Apply a 3 to 4 inch layer of compost to cover the entire exposed soil surface, extending approximately 3 feet over the top of the slope or meshing into existing vegetation (check with your local code enforcers and stormwater management officials first). Slightly coarse to coarse types of compost are well suited for holding surface soil in place even during heavy rainfall. Stockpiled topsoil should be covered with mulch or plastic sheeting.</p>	2-10	1
<p>Limit grading to an average of 20ft outside building footprint, or for infill lots, use compost to amend soils</p> <p>Minimizing grading helps retain healthy soil and natural water infiltration. Avoid disrupting existing drainage patterns and in general minimize grade changes where possible. Grading for stormwater control should direct water to planted areas to minimize irrigation needs. Steep slopes may benefit from terracing and retaining walls.</p>	2-11	2-3
<p>Use alternative foundation system that minimizes volume of foundation material, minimizes disruption to site hydrology, and/or keeps topsoil in place</p> <p>Preserving topsoil in place, without compaction, grading or excavation and replacement will maintain and preserve soil health and stormwater infiltration of the site both during construction and after completion of the project</p>	2-19	2
<p>Grind land clearing wood and stumps for reuse</p> <p>Grinding landclearing wood waste can be a cost-effective way to reduce jobsite waste and provide material for reuse as mulch (on site or at other locations). Mulch can renew the soil by improving water and nutrient retention and can also be used to protect stockpiled topsoil.</p> <p>The Green Communities checklist also offers additional points for milling lumber for higher end use on site (decorative finishes if there is a good specimen tree that can't be preserved for example, or for landscape fixtures, such as benches).</p>	2-12	2

Action Item	Checklist Reference	Points Available
<p>Use a water management and on-site filtration system to allow groundwater to recharge</p> <p>The Green Communities checklist offers several credits for constructing natural drainage patterns, infiltration basins, ‘artificial’ wetlands, and similar features that allow stormwater to remain on site and percolate back into the soil. Experience making these ‘Low Impact Development’ techniques work effectively will be valued by a green developer.</p>	2-15	5
<p>Use a biodiesel mix in on-site equipment and/ or vehicles</p> <p>Biodiesel is a renewable fuel made from a mixture of alcohol and vegetable or animal oils. Incorporating biodiesel into the fuel mix reduces particulate matter, toxins, and carbon monoxide emitted from engines. Biodiesel reduces the amount of petroleum, a non-renewable fuel, thereby reducing the risk of harming sensitive environments during extraction and transportation. Biodiesel works well in construction equipment and in all diesel cars. However, biodiesel has a higher alcohol content and acts as a solvent. Before using biodiesel, ensure that all equipment/engine hoses are made of synthetic rubber. New equipment run on biodiesel will not have fuel line or filter issues.</p>	2-52	1-4
<p>Total points for fulfilling all action items</p>		33

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LANDSCAPING CONTRACTORS

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Planning

Action Item	Checklist Reference	Points Available
<p>Use suppliers who offer and take back reusable and recyclable packaging</p> <p>Packaging makes up a significant portion of the waste generated on site. Many Built Green™ builders will require you to participate in their waste minimization and recycling programs; by asking your suppliers to take back packaging, you'll save yourself time and money.</p>	5-4	1
<p>Landscape with plants appropriate for site topography and soil types: or landscape with native plants appropriate for site topography and soil types, emphasizing use of plants with low watering requirements; or xeriscape</p> <p>Native vegetation is adapted to the Northwest climate of rainy wet winters and dry summers. Retaining native vegetation in a landscape (rather than removing them and then replanting) also provides excellent erosion, sediment, dust, and pollution control. Finally, native plants are more resistant to disease, insects, and low levels of nutrients, thus reducing the need for fertilizer or pesticides.</p>	2-35	2-5
<p>Preserve and protect existing native vegetation on-site to maintain its natural dust-suppression function</p> <p>During building layout, identify existing native plants, including trees and understory plants that you want to save. Clear only actual areas needed to install driveways, parking areas, and building foundations. Clearly mark areas to be graded on plans and field stake or flag on site.</p>	2-51	3
<p>Take extra precautions to protect trees during construction</p> <p>Whenever possible, protect entire stands of trees. Post signs on trees to be saved, clearly indicating the tree's monetary value (cost of replacement).</p>	2-5	3
<p>Use non-toxic or low-toxic pressure-treated wood</p> <p>Using non- or low-toxic materials in the landscape helps preserve soil and water quality. Examples include low-toxic wood preservatives, naturally rot-resistant woods, and plastic lumber (preferably with recycled content).</p>	5-78	3
<p>Limit use of turf grass to percentage of landscaped area</p> <p>Place turf in areas expected to be used for walking or playing. Don't plant lawns in heavy shade or in areas with saturated soils or heavy slopes. Always keep turf away from the water's edge; it increases likelihood of chemical contamination, reduces habitat and shading for wildlife, and may increase erosion potential.</p>	2-34	1-10

Action Item	Checklist Reference	Points Available
<p>Install rainwater collection system (cistern) for reuse in irrigation A rooftop rainwater collection system consists of a suitable roof and guttering system, a storage tank(s), and a simple filtration system. Rainwater can also be harvested from soil surfaces and outdoor paved surfaces. Let the homeowner know the rainwater supply is <i>not</i> intended for drinking. Graywater can also be plumbed to the irrigation system.</p>	2-37	5

On-Site

Action Item	Checklist Reference	Points Available
<p>Amend disturbed soil to a depth of 2 to 4 inches to restore soil environmental functions Amending soil helps restore its hydrological function and allows water to infiltrate more effectively. For Green Communities, the standard is 13 inches (rather than 8-10).</p>	2-13	2-4
<p>Replant or donate removed vegetation for immediate reuse Plants and trees can often be re-planted elsewhere on site, either immediately, or with proper protections, held for later transplant.</p>	2-14	5
<p>Use compost, vermi-compost or slow-release organic fertilizers to establish vegetation Moderate fertilization with natural or natural/synthetic slow-release combination fertilizers will help build soil nutrient reserves and biodiversity without contaminating waterways. Studies have shown that the majority of the phosphorus entering local lakes and areas of Puget Sound is coming from single-home residential areas. The primary source for this contaminant is fertilizers and soil wash-off.</p>	2-22	2
<p>Use compost soil amendment to establish turf and other vegetation with less irrigation Whether you seed or sod, all turf installations perform better when at least 2 inches of compost is tilled into the upper six inches of soil. Twelve inches is better for deep-rooted, drought-tolerant grasses.</p>	2-33	2
<p>Direct stormwater at least 5 ft away from building using grading and approved drain system as appropriate Stormwater or irrigation water that stands or seeps around crawlspace, slab, foundation or basement can lead to moisture damage, dampness and mold growth. Backfilled dirt around the footprint of a building should slope down and away for a distance of at least 5 feet to ensure surface runoff away from structure Preserve this grading during landscaping and ensure irrigation water is directed away from building perimeter.</p>	4-35	1
<p>Total points for fulfilling all action items</p>		44

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FLOORING CONTRACTORS

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Planning

Action Item	Checklist Reference	Points Available
<p>Use suppliers who offer and take back reusable and recyclable packaging</p> <p>Packaging makes up a significant portion of the waste generated on site. Many Built Green™ builders will require you to participate in their waste minimization and recycling programs; by asking your suppliers to take back packaging, you'll save yourself time and money.</p>	5-4	1
<p>If Using Carpet, Specify Low-VOC Carpets with the Carpet and Rug Institute (CRI) Indoor Air Quality (IAQ) Label</p> <p>New carpet can emit volatile organic compounds (VOCs) when first installed. The Carpet and Rug Institute has developed testing and labeling programs to aid in the selection of low-emitting carpet, adhesives, and cushion materials</p>	4-13	3
<p>If Using Carpet, Install Low-Pile or Less Allergen-Attracting Carpet and Pad and Choose Carpet without Brominated Flame Retardant, and Natural Fibers (e.g. Jute, Sisal, Wool, Bamboo) and/ or Recycled Materials</p> <p>Protect air quality by choosing a low pile carpet and installing it with urethane padding. Preferably, select a carpet made from natural fibers or an all-nylon carpet, which is less attractive to dust mites and mold.</p>	4-14	1-5
<p>If Using Carpet, Install Using Dry Method (No Glue)</p> <p>Adhesives used to install the carpet to the floor are a significant source of odor and air pollution. Tack strips eliminate this problem. As a last resort, choose a low-odor, water-based adhesive. Never use solvent-based carpet adhesive.</p>	4-16	1
<p>If Using Carpet, Limit Carpet to One-Third of Home's Conditioned Area</p> <p>The program recognizes carpet's popularity and function, but suggests the amount of carpeting can be limited. The healthiest floor choices are smooth surfaces, such as tile, linoleum, and wood, which are easier to clean than carpet and they keep vacuuming to a minimum. Wood and tile floors are also more durable than carpet, so they cost less per year of use.</p>	4-15	3
<p>No carpet in home</p> <p>Carpet off-gases when it is new. In addition, carpeting acts as a highly effective reservoir for allergens such as dirt, pollen, mold spores, dust mites, and other microbes. Moreover, as carpet wears out, the surface yarn breaks down and becomes house dust. For that reason, this program encourages eliminating carpet</p>	4-18	10

Action Item	Checklist Reference	Points Available
<p>Use only non-or-low-voc/toxic, water-based, solvent-free sealers, grouts, mortars, caulks, stain pigments, additives, and adhesives inside the house</p> <p>Conventional adhesives and finishes may off-gas large amounts of toxic VOCs (including solvents and aromatic hydrocarbons). Water-based varnishes, polyurethane, and other finishes for hardwood floors are very durable and much safer to handle than traditional products. Look for products with a maximum VOC content of 130-150 grams per liter. (Based on the State of California, South Coast Air Quality Management District Rule #1168)</p>	4-26	1-8
<p>Use glass, ceramic, porcelain or concrete flooring for occupied space</p> <p>Glass, Ceramic and Porcelain tile floors usually pose very little health risk on a day-to-day basis and are more durable than carpet, lowering overall cost. Note: The glazing used on imported tiles can contain lead.</p>	4-29	1-10
<p>Use reclaimed wood flooring</p> <p>Hardwood flooring is a valuable material, and if properly removed and refinished, can be reused.</p>	5-45	3
<p>Use recycled-content glass, ceramic, or porcelain tile</p> <p>Several manufacturers make glass, ceramic and porcelain tiles with recycled-content. These tend to be pricey, but are durable and offer an attractive opportunity to highlight (and market) the use of an environmentally friendly material to your client or market.</p>	5-46	3-5
<p>Use rapidly renewable flooring products with a 10-year harvest cycle or shorter (linoleum, cork, bamboo, or salvaged wood)</p> <p>Linoleum is made from natural materials and is durable and low-maintenance. Linoleum does not contain significant petroleum-based products or chlorinated chemicals, as does vinyl sheet flooring, which is often mistakenly referred to as linoleum. Cork and bamboo are durable, natural and renewable materials.</p>	5-42	2

On-Site

Action Item	Checklist Reference	Points Available
<p>Keep materials dry during construction and conduct a moisture test prior to close-in of walls and conditioned space; verify 15% or less</p> <p>Ensure moisture content of sub-floor is below 12% before installing finish floor.</p>	4-5	1-3
<p>Total points for fulfilling all action items</p>		54

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TRASH REMOVAL/CLEAN UP CONTRACTORS

Be a Built Green® Specialty Contractor! By offering the following options with your service, you'll add value for your customers and help build greener homes. Environmentally-minded homeowners will be pleased that you take special care with their project, and Built Green® Builders, Remodelers and Developers will know that in addition to your service, you'll be guaranteeing Built Green® points.

Here are some action items in the Tri-Cities Built Green® Checklist that will win Built Green® points and are easy to accomplish.

On-Site

Action Item	Checklist Reference	Points Available
<p>Achieve 85% minimum recycling rate for at least two of the following products: cardboard, metal scraps, wood/pallet scraps, packaging & pallet wrap, drywall, concrete, asphalt rubble, rock, brick, paint, asphalt roofing, land clearing, yard waste, and soil, glass, carpet padding, and upholstery foam</p> <p>Some companies, such as scrap metal dealers, will pay for recyclable material. Others charge to accept or pick up recyclables. Concrete, brick, asphalt rubble, and other building materials can be collected on site. Even if a fee is charged, however, it is generally less than fees paid for disposal. Recyclers have specifications for the quality, types, and grades of materials they can accept. To achieve the most benefit from your efforts, find out what these specifications are. Document all your drop-offs and provide information to your customers.</p> <p>Recycling opportunities exist for the following materials in the Tri-Cities area:</p> <ul style="list-style-type: none"> • Clean and demolition wood, landclearing, pallets and yardwaste • Cardboard • Scrap metal • Concrete, asphalt, rock, and brick • Drywall and plasterboard • Non-asbestos roofing materials • Packaging • Plastics 	5-17	1-15
Total points for fulfilling all action items		15

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