Cool PV
Sustainable Building and Remodeling
(Draft for discussion)

Objective:

Establish the processes, standards, resources and incentives to enable 100% of new homes, remodels, and landscapes in Portola Valley to be built in a sustainable manner.

Program Description:

Processes:

To support the goal of sustainable building, the BEET volunteers recommend the following processes be reviewed and/or designed to support sustainable building:

- **Design Process:** Provide homeowners with a framework for sustainable building, remodeling and landscaping using the newly released LEED for Home standards as the foundation. Include best practice case studies of how different homeowners approached their green projects and thrived.
    - Process guidelines would include:
        - A Framework and set of "Questions to Consider" around the five key areas of sustainability:
            - Energy (including future transportation)
            - Water
            - Waste
            - Materials
            - Habitat
        - A simple summary of the "From –To" shifts that make the difference between traditional building process and green building processes.
            - Examples:
                - From linear design and multiple handoffs over time to integrated design with all major parties at the table from the start (architect, contractor, interior, landscape, other).
                - From energy usage as an afterthought to energy usage as a design principal including energy modeling and sun studies.
                - From designing aspects of the home for single functionality to designing for multipurpose.
                - From focus on building to focus on lifestyle (for example, ensuring future transportation options built into design).
                - From building for the moment to 100 year design. "Future proofing".

        - An easy to read "project-at-a-glance" calendar that we could provide all new homeowners that helps them think through the process before they even begin to design.

- **Review Process:**
    - Review existing committees and commissions to ensure they facilitate, encourage and govern green building. Ensure integration and coordination among committees.

    - Assess current timing and practices for all committees/departments to determine if we have the correct sequencing and review mechanisms in place to support sustainable building and ensure compliance.

    - Review sequencing to make sure we are doing everything as a town to educate and encourage success before moving to "review". Consider adding a Green Building Team that could become a resource for homeowners to help them get off on the right foot. Adopt an attitude of wellness and preventive maintenance vs. damage control.

    - Review existing aesthetics guidelines to ensure promote green building materials. (solar panels, roofing materials, siding, etc.)

    - Review Homeowner Association guidelines to ensure consistency with town guidelines.

- **Construction Process:**
    - Develop/review construction process guidelines to ensure "greening" of the construction process.

    - Assess process to make sure we haven't built layer upon layer of bureaucracy to avoid the "one bad apple" problem. Consider having integrated team across various disciplines/committees participate in Process Improvement mapping exercise looking at the "as is" and brainstorming opportunities for a "to be" model. Look at other best practices adopted across the country.

    - Create town construction "exchange" to provide opportunity for jobs to share/offload material. Craig's list for construction projects. Leverage synergies across projects where possible.

Standards:

- **New Homes:**
    - Establish LEED for Homes as the standard to which all homes need to be built. Homeowners need not take the extra step to apply but must build to LEED standards.
        - The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ for Homes is a voluntary rating system that promotes the design and construction of high

performance "green" homes. A green home uses less energy, water, and natural resources; creates less waste; and is healthier and more comfortable for the occupants. Benefits of a LEED home include lower energy and water bills; reduced greenhouse gas emissions; and less exposure to mold, mildew and other indoor toxins. The net cost of building and owning a LEED home is comparable to that of building and owning a conventional home.

- The LEED Rating System is the nationally (and now internationally) recognized standard for green building. LEED certification recognizes and rewards builders for meeting the highest performance standards, and gives homeowners confidence that their home is durable, healthy, and environmentally friendly.
- The LEED H system has four levels of certification: certified, silver, gold and platinum.
- USGBC began the pilot test of LEED for Homes in August 2005. The pilot test will conclude in spring 2007 and USGBC will publicly launch the LEED for Homes rating system in summer 2007.

- Using an existing standard will facilitate the process of certification should homeowners want to take that extra step and reap the recognition and market value that LEED certification yields.

- Beyond LEED H. There are a number of areas of sustainable building not covered by LEED H which could be included in a broader - from sustainable to regenerative - "bonus" section of parameters that homeowners may not be aware of but which benefits they might want to consider. Currently such items would qualify for innovation points under LEED. We would consolidate a list with the help of the USGBC of all items that qualify/have qualified for innovation points. Examples might include:
  - Fossil fuel free homes
  - Constructed Wetlands
  - Natural swimming ponds in place of swimming pools
  - Alternative fuel fireplaces
  - Habitat creation
  - Green transportation plan (docking station and solar panels for EVs, bio diesel cars, hydro fuel cell, etc.)

- **Remodels:**
  - LEED H does not have a remodel focused certification process yet however the LEED H standards are applicable and/or easily modifiable for a remodel.

  - Ultimately LEED H will have a remodel component. In the meantime, work with LEED H leaders who have already told us they are willing to help develop a PV-specific adaptation and certification for remodels to fill the gap.

  - Provide checklist and resources for homeowners doing more minor remodels as a service. For example kitchen or bath remodels.

- Integrate with plan for New Homeowner Welcome Kit.

- **Landscape:**
  - LEED H covers landscapes in a variety of sections including Location and Linkages, Sustainable Sites and Water Efficiency.
  - National Wildlife Federation has a Backyard Habitat Certification Program.
  - StopWaste.Org has a Bay Friendly Landscape Guidelines targeted specifically to California's ecosystem.
  - The Town of Portola Valley has the Conservation Committee and ASCC.
  - TRA Environmental Services is helping the town document natives and non-natives and has documented all native birds, reptiles and mammals.
  - USGS and Pacific Aerial Surveys have aerial photos predating Portola Valley development for perspective on PV native landscape.
  - A PV specific landscape guideline could be established leveraging all these resources if desired. Would need to segment from total new landscape to any level of landscaping requiring review.
  - Town should consider identifying and protecting wildlife corridors.
  - Options for and benefits of creating conservation easements per the Lane's recent actions should be outlined for residents.

Incentives

The USGBC and other standards bodies focus primarily on incentives — encouraging and inspiring green building and use mandates/compliance as a back up. Look for opportunities in the process to provide incentives for green building, examples could include:

- Expedite the permit process
- Fee reductions
- Work with local real estate leaders to value and market "green homes"; testimonials to green building, beginning to market Portola Valley as the "greenest community in the Bay Area".
- Assistance with LEED and/or other applications if want to apply (see parameters).
- Recognition by the Town of Portola Valley:
  - Town Certificate (especially for areas of sustainability not covered by LEED), Beyond LEED.
  - PV green building tour
  - Green Home Club with annual banquet

    - Recognition at town event (picnic, Blues and BBQ)
    - Beat Title 24 contest.
- Group buying programs
- Create Town dashboard to which green homes can upload their information to show cumulative effect of sustainable practices/living.
- Give every homeowner about to remodel or build a copy of the Green Spec guide or Rocky Mountain Institute's Primer on Sustainable building for inspiration.
- Make it easy to build green:
    - Centralize resources
    - Easily accessible library of information
    - Town network
    - Goals to shoot for (most people are past the tipping point, they want to build green they just want to be given a template for what to do, they don't have the time, energy or resources to deal with the fragmentation that exists today, make it easy).

Resources

- Create Green Building Team (GBT) to include:
    - one paid Town position
    - 3-4 volunteers
    - consider some dual appointments to ASCC/planning commission and GBT
    - duties to include front-end and project resource to homeowners and potentially back end follow up on compliance and implementation (if ASCC isn't reorganized and/or resequenced to see the final design or review designs further along in the process (if that happens front end guidance will become even more critical to help owner's get it right the first time).
    - document best practices and market them
    - help create and manage the incentives
    - maintain town sustainable building website

- Maintain town website listing green resources and resident ratings of those resources (i.e. for green resources focused on PV residents):
    - Architects
    - Contractors
    - Interior designers
    - Landscape
    - Lighting
    - Structural engineers (Optimum Value Engineering/ Advanced framing etc)
    - Pool/Pond vendors
    - Deconstruction/recycling options
    - Subcontractors
    - Wholesale and Retail sources for green materials
    - Green experts
        - LEED professionals
        - Building Science
        - Energy modelers
        - Title 24 Consultants
        - Permaculture specialists

        - Organic gardening design/maintenance
        - Dashboard vendors
        - Constructed Wetlands
        - Wildlife/Habitat specialists/Field biologists

- Provide list of Free services:
    - PGE Energy Center (includes PGE Heliodon for sun studies)
    - PGE Food Service Technology Center

- Maintain list of current independent rating bodies for specific products and easy access to their lists: Examples:
    - ACEEE- American Council for an Energy Efficient Economy
    - CEE – Consortium for Energy Efficiency (listing of products beyond Energy Star)
    - Building Green and their GreenSpec guide
    - PGE Food Service Techonology Center
    - FSC – Forest Stewardship Council
    - Rugmark

- Devote section of the new library to sustainable living with a series of sub-sections including green building, remodeling, landscaping, transportation, alternative energy, green financing and many more. Subscribe to range of newly emerging green newsletters, e-lettters, magazines and journals.

- Maintain continuously updated set of best practice case studies to share knowledge and experiences including ongoing surveys of cost benefit analyses and overall results as projects mature and these become better understood.

- Provide central resource identifying financial incentives/ways to reduce construction costs:
    - Updated list of rebates available
    - Green building funding alternatives
    - Help identifying green subs with green building experience (those are the ones who don't tack on 20% because they don't understand it).
    - Network of folks willing to share cost comparisons (help break the myth that green is twice as expensive).

- Develop network of town residents willing to help others through the process.

- Work across the community to integrate and communicate all community efforts including the schools, town, residents, services.

- Identify Communication/Media/Events of interest:
    - BuildingGreenTV
    - Building Green Home Tours
    - Workshops
    - Magazines devoted to Green Building

Costs and Additional Resources

- One FTE town employee
- Additional funds for development of additional areas of Town website and construction "exchange"
- Other funds anticipated to be part of normal town activity
- Grants or private donations may be available to seed fund additional costs
- Green Building Team Volunteers

Project Checklist

LEED for Homes

Builder Name:	
Home Address (Street/City/State):	

Input Values: No of Bedrooms: 4 Floor Area (SF): 2400

Minimum No. of Points Required: Certified: 45 Silver: 60 Gold: 75 Platinum: 90

Detailed information on the measures below are provided in the companion document "LEED for Homes Rating System"

Y / Pts	No	N/A						Max Points Available
Innovation and Design Process (ID)						(Minimum of 0 ID Points Required)		**9**
			1.1	**Integrated Project Planning**		Preliminary Rating		Prerequisite
			1.2			Integrated Project Team		1
			1.3			Design Charrette		1
			2.1	**Quality Management for**		Durability Planning; (Pre-Construction)		Prerequisite
			2.2	**Durability**		Wet Room Measures		Prerequisite
			2.3			Quality Management		Prerequisite
			2.4			Third-Party Durability Inspection		3
			3.1	**Innovative / Regional Design**		Provide Description and Justification for Specific Measure		1
			3.2			Provide Description and Justification for Specific Measure		1
			3.3			Provide Description and Justification for Specific Measure		1
			3.4			Provide Description and Justification for Specific Measure		1
0				Sub-Total				
Location and Linkages (LL)						(Minimum of 0 LL Points Required)	OR	**10**
HOLD			1	**LEED-ND Neighborhood**			LL2-5	10
			2	**Site Selection**		Avoid Environmentally Sensitive Sites and Farmland	LL1	2
			3.1	***Preferred Locations***		Select an Edge Development Site	LL1	1
			3.2		***OR***	Select an Infill Site	LL1	2
			3.3			Select a Previously Developed Site	LL1	1
			4	**Infrastructure**		Site within 1/2 Mile of Existing Water and Sewer	LL1	1
			5.1	**Community Resources**		Basic Community Resources / Public Transportation	LL1	1
			5.2	**& Public Transit**	***OR***	Extensive Community Resources / Public Transportation	LL1	2
			5.3		***OR***	Outstanding Community Resources / Public Transportation	LL1	3
			6	***Access to Open Space***		Publicly Accessible Green Spaces	LL1	1
0				Sub-Total				
Sustainable Sites (SS)						(Minimum of 5 SS Points Required)	OR	**21**
			1.1	**Site Stewardship**		Erosion Controls (During Construction)		Prerequisite
			1.2			Minimize Disturbed Area of Site		1
			2.1	**Landscaping**		No Invasive Plants		Prerequisite
			2.2			Basic Landscaping Design		2
			2.3			Limit Turf		3
			2.4			Drought Tolerant Plants		2
			3	**Shading of Hardscapes**		Locate and Plant Trees to Shade Hardscapes		1
			4.1	**Surface Water Management**		Design Permeable Site		4
			4.2			Design and Install Permanent Erosion Controls		2
			5	**Non-Toxic Pest Control**		Select Insect and Pest Control Alternatives from List		2
			6.1	**Compact Development**		Average Housing Density ≥ Units / Acre	LL1	2
			6.1		***OR***	Average Housing Density ≥ 10 Units / Acre	LL1	3
			6.3		***OR***	Average Housing Density ≥ 20 Units / Acre	LL1	4
0				Sub-Total				
Water Efficiency (WE)						(Minimum of 3 WE Points Required)	OR	**15**
			1.1	**Water Reuse**		Rainwater Harvesting System		4
			1.2			Grey Water Re-Use System		1
			2.1	**Irrigation System**		Select High Efficiency Measures from List		3
			2.2			Third Party Verification		1
			2.3		***OR***	Install Landscape Designed by Licensed or Certified Professional	WE 2.2	4
			3.1	**Indoor Water Use**		High Efficiency Fixtures (Toilets, Showers, and Faucets)		3
			3.2		**OR**	Very High Efficiency Fixtures (Toilets, Showers, and Faucets)	WE 3.1	6
0				Sub-Total				

Project Checklist (cont'd)

HERS Index Value Achieved: 86
IECC Climate Zone: 1

EA 1.2 Pts Achieved: 0.0

Y / Pts	No	N/A						
Energy and Atmosphere (EA)					(Minimum of 0 EA Points Required)		OR	38
			1.1	**ENERGY STAR Home**	Meets ENERGY STAR for Homes with Third-Party Testing			Prerequisite
			1.2		Exceeds ENERGY STAR for Homes		EA 2-10	34
			7.1	**Water Heating**	Improved Hot Water Distribution System			2
			7.2		Pipe Insulation			1
			11	**Refrigerant Management**	Minimize Ozone Depletion and Global Warming Contributions			1
0			Sub-Total (or Sub-Total from Adendum A - Prescriptive EA Credits)					
Y / Pts	No	N/A						
Materials and Resources (MR)					(Minimum of 2 MR Points Required)			14
			1.1	**Material Efficient Framing**	Overall Waste Factor for Framing Order Shall be No More than 10%.			Prerequisite
			1.2		Advanced Framing Techniques			3
			1.3		*OR* Structurally Insulated Panels		MR 1.2	2
			2.1	**Environmentally Preferable**	Tropical Woods, if Used, Must be FSC			Prerequisite
			2.2	**Products**	Select Environmentally Preferable Products from List			8
			3.1	**Waste Management**	Document Overall Rate of Diversion			Prerequisite
			3.2		Reduce Waste Sent to Landfill by 25% to 100%			3
0			Sub-Total					
Y / Pts	No	N/A						
Indoor Environmental Quality (IEQ)					(Minimum of 6 IEQ Points Required)		OR	20
			1	**ENERGY STAR with IAP**	Meets ENERGY STAR w/ Indoor Air Package (IAP)		IEQ2-10	11
			2.1	**Combustion Venting**	Space Heating & DHW Equip w/ Closed/Power-Exhaust		IEQ 1	Prerequisite
			2.2		Install High Performance Fireplace		IEQ 1	2
			3	**Moisture Control**	Analyze Moisture Loads AND Install Central System (if Needed)		IEQ 1	1
			4.1	**Outdoor Air Ventilation**	Meets ASHRAE Std 62.2		IEQ 1	Prerequisite
			4.2		Dedicated Outdoor Air System (w/ Heat Recovery)		IEQ 1	2
			4.3		Third-Party Testing of Outdoor Air Flow Rate into Home			1
			5.1	**Local Exhaust**	Meets ASHRAE Std 62.2		IEQ 1	Prerequisite
			5.2		Timer / Automatic Controls for Bathroom Exhaust Fans		IEQ 1	1
			5.3		Third-Party Testing of Exhaust Air Flow Rate Out of Home			1
			6.1	**Supply Air Distribution**	Meets ACCA Manual D		IEQ 1	Prerequisite
			6.2		Third-Party Testing of Supply Air Flow into Each Room in Home			2
			7.1	**Supply Air Filtering**	≥ 8 MERV Filters, w/ Adequate System Air Flow		IEQ 1	Prerequisite
			7.2		*OR* ≥ 10 MERV Filters, w/ Adequate System Air Flow			1
			7.3		*OR* ≥ 13 MERV Filters, w/ Adequate System Air Flow			2
			8.1	**Contaminant Control**	Seal-Off Ducts During Construction		IEQ 1	1
			8.2		Permanent Walk-Off Mats *OR* Shoe Storage *OR* Central Vacuum			2
			8.3		Flush Home Continuously for 1 Week with Windows Open			1
			9.1	**Radon Protection**	Install Radon Resistant Construction if Home is in EPA Zone 1		IEQ 1	Prerequisite
			9.2		Install Radon Resistant Construction if Home is not in EPA Zone 1		IEQ 1	1
			10.1	**Garage Pollutant Protection**	No Air Handling Equipment OR Return Ducts in Garage		IEQ 1	Prerequisite
			10.2		Tightly Seal Shared Surfaces between Garage and Home		IEQ 1	2
			10.3		Exhaust Fan in Garage			1
			10.4		*OR* Detached Garage or No Garage		IEQ 1	3
0			Sub-Total					
Y / Pts	No	N/A						
Awareness and Education (AE)					(Minimum of 0 AE Points Required)			3
			1.1	**Education for Homeowner**	Basic Occupant's Manual and Walkthrough of LEED Home			Prerequisite
			1.2	**and/or Tenants**	Comprehensive Occupant's Manual and Multiple Walkthroughs / Trainings			1
			1.3		Public Awareness of LEED Home			1
			2.1	**Education for Building Mgrs**	Basic Building Manager's Manual and Walkthrough of LEED Home			1
0			Sub-Total					
0			**Project Totals (pre-certification estimates)**					130

for Homes

Project Checklist, Addendum A

Prescriptive Approach for Energy and Atmosphere (EA) Credits

Detailed information on the measures below are provided in the companion document "LEED for Homes Rating System"						*Max Points Available*
Y / Pts	No	N/A	**Energy and Atmosphere (EA)**	(Minimum of 0 EA Points Required)	OR	38
			2.1 **Insulation**	Third-Party Inspection of Insulation, At Least HERS Grade II	**EA 1**	Prerequisite
			2.2	Third-Party Inspection of Insulation, Grade I AND 5% above code	**EA 1**	2
			3.1 **Air Infiltration**	Third-Party Envelope Air Leakage Tested </= 7.0 ACH50 (CZ 1-2)	**EA 1**	Prerequisite
			3.2	Third-Party Envelope Air Leakage Tested </= 5.0 ACH50 (CZ 1-2)	**EA 1**	2
			3.3	***OR*** Third-Party Envelope Air Leakage Tested </= 3.0 ACH50	**EA 1**	3
			4.1 **Windows**	Windows Meet ENERGY STAR for Windows (See Table)	**EA 1**	Prerequisite
			4.2	Windows Exceed ENERGY STAR for Windows (See Table)	**EA 1**	2
			4.3	***OR*** Windows Exceed ENERGY STAR for Windows (See Table)	**EA 1**	3
			5.1 **Duct Tightness**	Third-Party Duct Leakage Tested </= 4.0 CFM25 / 100 SF to Outside	**EA 1**	Prerequisite
			5.2	Third-Party Duct Leakage Tested </= 3.0 CFM25 / 100 SF to Outside	**EA 1**	2
			5.3	***OR*** Third-Party Duct Leakage Tested </= 1.0 CFM25 / 100 SF to Outside	**EA 1**	3
			6.1 **Space Heating and Cooling**	Meets ENERGY STAR for HVAC w/ Manual J & refrigerant charge test	**EA 1**	Prerequisite
			6.2	HVAC is Better than ENERGY STAR	**EA 1**	2
			6.3	***OR*** HVAC Substantially Exceeds ENERGY STAR	**EA 1**	4
			7.1 **Water Heating**	Improved Hot Water Distribution System		2
			7.2	Pipe Insulation		1
			7.3 **Water Heating**	Improved Water Heating Equipment	**EA 1**	3
			8.1 **Lighting**	Install at Least Three ENERGY STAR labeled Light Fixtures (or CFLS)	**EA 1**	Prerequisite
			8.2	Energy Efficient Fixtures and Controls	**EA 1**	2
			8.3	***OR*** ENERGY STAR Advanced Lighting Package	**EA 1**	3
			9.1 **Appliances**	Select Appliances from List	**EA 1**	2
			9.2	Very Efficient Clothes Washer (MEF > 1.8, *AND* WF< 5.5)	**EA 1**	1
			10 **Renewable Energy**	Renewable Electric Generation System (1 Point / 5% Reduction)	**EA 1**	10
			11 **Refrigerant Management**	Minimize Ozone Depletion and Global Warming Contributions		1
0			Sub-Total			

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been met for the indicated credits and will, if audited, provide the necessary supporting documents.

Builder's Name _____ Company _____

Signature _____ Date _____

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the required inspections and performance testing for the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been completed, and will provide the project documentation file, if requested.

Rater's Name _____ Company _____

Signature _____ Date _____

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the required inspections and performance testing for the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been completed, and will provide the project documentation file, if requested.

Provider's Name _____ Company _____

Signature _____ Date _____