

SCOTTSDALE GREEN BUILDING PROGRAM PROGRESS REPORT

Green Building is a whole systems approach utilizing design and building techniques to minimize environmental impact and reduce the energy consumption of a building while contributing to the health of its occupants.

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Green Building Advisory Committee 2002/03

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EXECUTIVE SUMMARY

February 2004

The City of Scottsdale has been an innovative leader in environmental issues. We built the Indian Wash Greenbelt, developed the Environmentally Sensitive Lands Ordinance, and provided leadership in many EPA programs (e.g. National Performance Track, Green Lights). In 1998, Scottsdale was the first Arizona community to establish a Green Building Program.

The Green Build Program was developed to encourage environmentally responsible building by incorporating healthy, resource- and energy-efficient materials and methods in the design and construction of homes. The program's goals are:

- To reduce the environmental impact of building
- Achieve both short and long-term savings in energy, water and other natural resources
- Encourage a healthier indoor environment.
- To educate the public and the development community in sustainable building practices

The Scottsdale Green Building Program has gained national recognition for leadership in sustainable building practices, and Staff has been frequently requested to speak on Green Building and sustainability issues, process issues, and program implementation. Our program has many significant outputs:

- A highly attended Lecture Series (2003 average 65 at 10 lectures - 650 people)
- An extensive residential checklist w/explanations to assist the community
- Hosted/Coordinated a successful Expo with the City of Phoenix (2003 attendance 2500)
- Has 99 builders and 230 permit issued projects in the program (1998 - 2003)
- Offered technical assistance to qualifying and non-qualifying projects for energy/resource efficiency, indoor environmental quality and water conserving measures.
- Along with City Cable 11, developed the series, Desert Green highlighting green building and solar practices, projects, and strategies
- Provides a web-site (www.scottsdaleaz.gov/greenbuilding) with program criteria, builder profiles, upcoming events, and links to other environmental building resources

The Green Building Advisory Committee, a standing committee of the Environmental Quality Advisory Board, consists of 14 hard working individuals. They give guidance to the program, create materials, and assist in creating and managing the events above. Some of our current projects are:

- Development of a Green Remodeling Guidelines/Program
- Development of a Green Commercial Rating Checklist
- Promoting the use of Green Building practices in all new and remodeled city facilities

It is noteworthy that the DC Ranch development has championed green building for their newest phase of Planning Unit 1. All six of the production and multi-family builders in this development have committed to building under the Green Building Program guidelines, representing 622 single-family homes and a 202-unit apartment complex. Construction is expected to begin in early 2004.

Finally, the city has shown vision and innovation by completely integrating the Green Building Program into the building regulatory process. The key of this is improved customer service, and better utilization of existing staff in Building, Plan Review, and Inspection Services.

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INTRODUCTION TO GREEN BUILDING

Why are we doing Green Building?

The Green Building Program is designed to encourage sustainable and healthy building in homes, businesses, and institutional buildings while informing the general public of the environmental quality of the built environment. The program reflects a concern for natural resources and environmental quality in our local and mutually dependent global environment. The goal of the Green Building Program is to shift both residential and commercial building practices toward sustainable approaches that conserve not only energy, water and other natural resources, but also preserve our environment, strengthen our local economy and promote a quality of life that is enduring over time.

What is Green Building?

A green building is a whole-systems approach utilizing design and building techniques to reduce energy consumption and minimize the environmental impact of building while contributing to the health of its occupants. A green building ideally would:

- Make appropriate use of land,
- Preserve plants, animals, endangered species, and natural habitats,
- Make efficient use of limited natural resources and materials with low embodied energy,
- Enhance human health for builders and homeowners,
- Use non-toxic and recycled-content materials,
- Reduce total lifetime energy usage,
- Have a positive effect and increased productivity on occupants working and living spaces,
- Be economical to build and operate, and at the end of building life,
- Demonstrate recyclability.

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PROGRAM OVERVIEW AND HISTORY

Development of Program

Although, the City of Scottsdale Green Building Program was officially established in February 1998, its genesis took place several years earlier. In 1995 the then City Building Official, Anthony Floyd, had taken a one-year educational leave of absence to study growth and development issues associated with sustainability. Upon his return in 1996, he was given the opportunity to help develop a sustainable building initiative. From 1996 to 1998, the green building portion of this position had evolved from a part-time to a full-time position. During the course of this process, the first green building guidelines were developed.

Meanwhile, in the spring of 1997, without knowledge of city efforts, Denny Miller of Omni Block and Paul Decker of Decker Homes approached the city to propose a Green Building Program. This interest from the construction community initiated the formation of an ad-hoc committee to help establish a Green Building Program. During the summer and fall, two other individuals joined the committee: Tom Hahn, ASU College of Architecture/Sol Source and Richard Zimmerman, AZ Sunshine Publishers. Staff and the ad-hoc committee gathered information from various programs around the region and country¹. (See Appendix E: Comments From the 1998 Green Building Advisory Committee for their forward looking perspectives.) In December of 1998, the Environmental Quality Advisory Board (EQAB) created a standing committee – The Green Building Advisory Committee (GBAC) – to assist and advise both EQAB and Staff, and to champion the program.

Scottsdale's program was designed to encourage environmentally responsible building in the context of Sonoran desert. Due to the high volume of residential construction, it was decided that a residential program would be the most effective place to start. Like other programs, Scottsdale's program would be strictly voluntary and non-regulatory. However, unlike most programs, Scottsdale's program would be free of charge and not require a membership. A green building checklist was developed to rate homes in the environmental impact categories of site, energy, building materials, indoor air quality, water, and solid waste. Flexibility was key in the development of the rating system. A minimum number of points were required from the 18 categories of the 150 plus item checklist. The designer, builder, and/or project owner would select their options from the checklist to qualify a building into the program. Since the first checklist in 1998, there have been four content revisions and one major restructure. As processes and technology have evolved, so has the Green Building checklist. The checklist is on the forefront of sustainable building practices in the United States.

In 1997, the city of Scottsdale joined the US Green Building Council and participated in the first Local Government Green Building Initiative meeting held in San Diego in February 1998. About 14 representatives attended the meeting². Initiatives were shared and strategies were developed to broaden the reach of green building. In March and April of the same year, Scottsdale was invited to several City of Phoenix Environmental Quality Advisory Commission meetings to share information on the development of Scottsdale's Green Building Program, as they were evaluating feasibility of starting a similar program.

¹ Some of the organizations and programs that were used as resources included the City of Austin Green Building Program, Green Builder Program of Metro Denver, Build a Better Kitsap Green Building Program (Kitsap County, WA), Civano Builder Program Workshop (Tucson Institute for Sustainable Communities), EPA Energy Star Program, ASU College of Architecture and Environmental Design, APS Environmental Showcase House, Salt River Project, Arizona Energy Office, Arizona Vision Weavers, and Engineered for Life Program (Green Stone).

² Attendees included the cities of Austin, Los Angeles, New York, San Diego, San Francisco, San Jose, Tucson, Santa Monica, Santa Barbara, Seattle, and Global Green USA.

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In September of 1998, as a result of Scottsdale's collaboration, the Arizona Environmental Strategic Alliance formed the Green Construction Collaboration Team. Some of the participating organizations included Southwest Gas, APS, SRP, Arizona Energy Office, Arizona Department of Environmental Quality, and representatives of the building industry. This team planned various educational projects to inform the buying, building and regulating communities about the environmental and economic benefits of green construction choices. The Collaboration Team sought funding to produce educational material.

The Scottsdale Green Building program fostered the creation of the Arizona Chapter of the US Green Building Council. In August, 2001, the US Green Building Council held its' national membership summit in Tucson, where it was decided to form a state chapter. Scottsdale's Green Building Program and Committee hosted the organizational meetings until it was officially established in January 2003. As the Scottsdale Green Building Program is limited to servicing Scottsdale citizens, the Arizona Chapter has a broader perspective, and gets its (and our) message out across the entire state.

A key strength of the Scottsdale Green Building Program has been our ability to both collaborate and lead in the efforts to promote sustainable building practices. See below for some of the involved organizations³.

Green Building Advisory Committee

In December of 1998, the Environmental Quality Advisory Board (EQAB) created and appointed the Green Building Advisory Committee (GBAC). The GBAC now has 14 appointed committee members, and serves under the direction of EQAB.

The Scottsdale GBAC has been key in the creation of the program as it helps city staff develop and sustain a pro-active campaign for environmentally responsible building. They have been extremely active, and there have been at least eight sub-committees involved in residential criteria, commercial criteria, remodeling guidelines, deconstruction/waste reduction, promotion, education (Green Building Lecture Series, Solar Lecture Series) and events (Green Home Tours, Expos, etc.)

Green Building Program Committee for 2003/2004	
Daniel Basinger, Chairman, EQAB Liaison	DeeJaye Lockwood, Windermere Sonoran Properties
Daniel Aiello, Janus II Environmental Architects	Denny Miller, Omni Block, Inc.
Nick Davis, Beck Group	Richard Polito, Maricopa Co. Envir. Services
Linda Eales, Linda Eales Design Associates	Connie Sloan, Sloan Homes
Kevin Edwards, Edwards Design Group	Frances Smith, Southwest Gas Corp.
Ronald W. Hand, AIA/CSI/CDT, EQAB Liaison	Thomas Tahmassian, A.T.T. Consultants
William Heller, EPC Corporation	Beverly Westgaard, AZ Envir. Strategic Alliance
Mary Grace Hime	Richard Zimmerman, AZ Sunshine Publishers

³ US Green Building Council, City of Austin Green Building Program, Metro Denver Green Builder Program, What's Working, Tucson Institute for Sustainable Communities, EPA Energy Star Program, ASU College of Architecture & Environmental Design, Arizona Energy Office, Arizona Department of Environmental Quality - Pollution Prevention Unit, Arizona Solar Energy Association, Arizona Vision Weavers, Southwest Gas, APS and SRP

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Past Appointed Committee Members	
Deborah Coburn, Healthy Housing	Marieke Reijalt, EnTire Project
Paul Decker, Decker Homes	Richard T. Schwab, Pinnacle Real Estate
Sandra Dominguez, Arthek Design Studio	Richard Scott, 1st USA
Tom Hahn, Sol Source/ASU	Mark Stoltzmann, Golden Flame
Dee Jaye Lockwood, Envision	Paul Vecchia, Neil/Vecchia & Associates
Bob Morris, John Hall & Associates	Daniel J. Osterman, Sundt Construction, Inc.

The GBAC's non-appointed membership (volunteers) has also involved over 30 environmental building advocates representing the design, construction, building product, real estate, and environmental communities.

Non Appointed Committee Members	
Cheryl Anderson, Desert Botanical Garden	Adam Lupein, Radiant Barrier Contr.
Kathi Anderson, Russ Lyon Realty	Cindy Lynch, New West Energy
Pete Anzures, Building Inspector	Tom Norris, Tom Norris Homes
Gary Berlin, U-Build-It	Louise Rehse, The Reference Library
Cody Boyces, RKA Architects	Jim Rockwell, Eco-Logic
Chuck Burke, ADEQ Pollution Prevention	Steve Sales, Granite Reef LLC
George Catone, Cuningham Group	Suvira Shyamlee, Presnell Westar
Su-shien Cho, Su-Shien Design, Inc.	Bruce Specter, Spectrum Financial Group
Ellen Crean, Pure Environment Consulting	Christina Suarez Farrell, R & R Images
Sandra Dominguez, Orcutt/Winslow Partnership	George Sutherland, Enviro-Products & Dev.
Tami L. Gallaway, SunCor	David Tschilar, Tschilar-Petersen Ventures
Sarah Greene, The Greene Room	Stephen Vedral, Frog's Leap Design Group
Asheeta D. Gupte, Cuningham Group	Clinton Wilkins, Phoenix Cement Company
Darren Haenny, Wolf Environmental	Joan Yost, Citizen
Nicholas Hild, Arizona State University East	Ray Zorz, Scottsdale Chamber of Commerce
Caroline Lobo, Orcutt/Winslow Partnership	Chance Pierce, Paint Once
Michele Cohen, EQAB	Michael Mulroy, EQAB
Joan Borter, AZ Masonry Guild	Dawn Faull, AZ. Masonry Guild
Dawn Olson, AZ. Masonry Guild	Dixon Oates, Honeywell
Denise Muollo, Student	Janet Gram, Student
Michael Tometich, ESS Engineering	Carol Fern, ESS Engineering
Bob Souva, Residential Design Enterprises	Richard Scott, Oracle Architecture
Martin "Rocky" Bakal, Citizen	Beth Hoffman, Citizen

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PROGRAM OPERATION

Administration and Funding

The program officially began in February 1998 without a budget. During these formative years, many program contacts were made and seeds of support established. Initial support and in-kind services came from both within and outside city government, including the city Development Services Division, Environmental Affairs Office, the Arizona Department of Environmental Quality - Pollution Prevention Unit and Southwest Gas.

By 1999, a part-time contract "green building inspector" position was created and funded by the Inspection Services Division through their contract services budget. In the year 2000, this position changed to "project coordinator/inspector" and became a full-time contract position. Also during this year a green building budget center was created in the amount of \$154,644. By 2002, a green building revenue account was established to collect revenues generated from the annual Green Building Expo. The account is dedicated to the promotion and education of green building.

In 2003, the city made a commitment to fully integrate green building into the building regulatory process. With this change, the Green Building Program has been relocated to the Building Plan Review division (where the budget has been transferred) of the Planning and Development Services Department. (See Appendix A for Budget History.)

Incentives

Being consumer driven, the Green Building Program has engaged in an on-going effort to bring the program to the attention of the general public and building industry. These items help us build the awareness and provide incentives for participation.

Priority plan review - All qualified green building projects receive fast track plan review service. This means green building projects receive building permits in half the time as regular projects depending on degree of complexity. Development process assistance is offered in the resolution of compliance issues.

Educational programs - The City of Scottsdale sponsors home tours, expositions, seminars and lectures for energy/resource efficient and environmentally responsible buildings. These events demonstrate and feature strategies in: site use, energy, building materials, indoor air quality, water and solid waste reduction.

Green building inspections and certification - The City provides a series of green building inspections to ensure the project is following prescribed guidelines. From a homebuyer's perspective, this extra inspection process ensures a superior quality product as compared to typical building projects. Upon successful completion of the project, a Certificate of Occupancy is issued with a special Green Building designation.

Homeowner's manual - A homeowner's manual explaining the green building features is presented to the builder for transfer to the building owner. The manual is in layman's terms and helps to describe the uniqueness of the projects.

Directory of participating designers and builders - Participating architects, designers and builders are listed and published in promotional materials. This material is on the city web site and is a part of the green building information packets, which is distributed at public events and mailed out to the general public on request.

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Promotional package for builders/developers - Promotional packages include green building logo for ads, brochures, and abbreviated green building checklists. The Green Building Program provides additional media coverage in the form of press releases and articles in the local news media, including City Cable 11, Tribune, Arizona Republic, and Scottsdale Independent.

Job site signs - City green building construction job site signs are available to distinguish projects involved in the program. This serves as a billboard that informs the general public of the builder's commitment to environmentally responsible building and the long-term health of the community.



Job site sign

Residential Criteria

The first residential checklist was organized by environmental impact areas. Points were assigned to each checklist item and a minimum number of points were required in each category in order to qualify a project into the program. During the first two years of the program, minor revisions were made to the checklist.

August 2001 culminated a year and half effort to revise the checklist spearheaded by Denny Miller, Chair, Residential Checklist Committee. The revisions were based upon feedback and experience gained from program participants. Additional input was received from many other individuals and groups.⁴ The checklist has been a “state of the art” guideline and standard for rating environmentally responsible buildings relative to site, energy, material resources, indoor air quality, water, and solid waste.

The philosophy behind Scottsdale's green building rating approach has been to keep it simple, flexible, and meaningful. The new rating system incorporates the following major changes:

- 1) Reorganized into 14 categories, aligned with sequence of construction.
- 2) Twenty-six (26) mandatory requirements used as prerequisites to enter into the program.
- 3) Two levels of participation: The applicant must select either the Entry Level (26 points required) or Advanced Level (56 points required)
- 4) Special Options for acquiring bonus points.

We will continue to update the checklist to stay current with rapidly changing materials, strategies, and technologies. We will also continue to address the specific needs of production builders as related to “site use” options for subdivisions.

Commercial Criteria

In July 2001, Scottsdale released the draft Green Building Guidelines for commercial projects. The draft rating/checklist represents a year and a half of research and collaboration spearheaded by Bill Heller, Chair, Commercial Checklist Committee. The commercial rating/checklist is based upon input and feedback from a wide range of perspectives and existing rating systems, including the City of Austin Green Building Program, US Green Building Council's LEED (Leadership in Energy and Environmental Design), and BREEAM (Building Research Environmental Assessment Method). The Scottsdale green commercial checklist has been used on a case-by-case basis as an option for those green projects that are being certified under the LEED rating

⁴ Including the State Energy Office, ASU College of Architecture & Environmental Design, APS, Southwest Gas, Home Builders Association of Central Arizona, What's Working (national green building consultant), solar energy industry, builders, designers and an assortment of building product representatives.

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system. From 2000-2003, eleven commercial projects have qualified under the commercial criteria.

In the summer of 2003, the commercial checklist committee was reformed to do a major update. The intent is to integrate green commercial projects into the city review and inspection process, similar to the green residential process.

Residential Remodeling Guidelines

The development of the Home Remodeling Guidelines began during the fall of 2002. Many existing green remodeling programs were reviewed and served in the development of the first draft in early 2003. A remodeling subcommittee, chaired by Ron Hand, was formed and is expected to complete the consumer friendly document in early 2004. In concert with this effort, several city departments have collaborated to make companion documents related to building permit information, historic preservation and general design guidelines for older tract home developments. The Home Remodeling Guidelines will be organized by type of remodeling project including landscaping, kitchen, bathroom, additions, energy performance upgrades, indoor environmental quality, and general room improvements.

City Facility Guidelines

After several years of informal discussion with city staff and management, a formal presentation was made in January 2003 to the city Capital Project Management (CPM) staff on green building in general and the US Green Building Council LEED™ rating system in particular. During the first quarter of 2003, several projects were identified as candidates for green building strategies and LEED™ certification. The first city committed LEED™ building is the new Scottsdale Senior Center at the McDowell Village redevelopment site. By early 2004, the project received preliminary design approvals and is continuing on with design development and construction documents. Construction is expected to begin in Fall 2004.

In August 2003, the Scottsdale Environmental Quality Advisory Green Building Advisory Committee unanimously passed a resolution to require all newly constructed and remodeled city facilities 5,000 sq. ft. or more to meet the LEED™ Silver rating level. Interdepartmental support was gathered in preparation for city council adoption, which is expected to occur in Spring 2004.

Project Qualification and Plan Review Process

In an effort to streamline the green building review process, a pre-application/qualification meeting is required for all projects. This requires the building applicant to meet the program criteria by completing the green building checklist and placing the checklist on one sheet of the construction plans. The green building program manager and two of the building plan reviewers conducts the project qualification meetings on a rotating basis.

The qualification meetings are designed to answer questions and resolve potential plan review issues. This in turn helps to streamline the "fast track" plan review process that's offered as an incentive for all green building projects. All designated green building projects are reviewed through the building, planning, fire and civil engineering review process in half the time as regular projects (2-3 weeks). The building plan review staff reviews each project for conformance to program criteria based upon the applicant's submitted checklist.

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Scottsdale's plan review and inspection process for green building projects

Project Qualification/Pre-application Meeting

Prior to completion of project construction documents, applicants must schedule a meeting with Building Plan Review staff. For each project enrolled, the following documents must be completed:

- Enrollment form & builder's agreement.
- Rating worksheet (checklist required on plans)
- A green building inspection manual is created and filed.

Depending on selected checklist items, other submittal information may be required.



Plan Review

After applicant receives Green Building qualification, the plans and required documents are submitted to the One Stop Shop "Plan Review/Permit Services" counter.

- Plans are reviewed for mandatory green building checklist items.
- Full checklist is required to be listed on the construction plans.



Building Permit and Inspections

Upon approval of plans, a building permit is issued with green building inspection manual and designation.

- The project will follow the green building inspection sequence.
- Projects not able to maintain qualification as a green building will be forced to stop work until plans are resubmitted with revisions as a non-participating project. Plan revisions will subject to additional review fees.



Certificate of Occupancy

After successful final inspection, a Certificate of Occupancy is issued with Green Building designation.

- Green building inspection manual is returned to administrative staff.
- Builder and Project Owner packets are compiled and mailed.

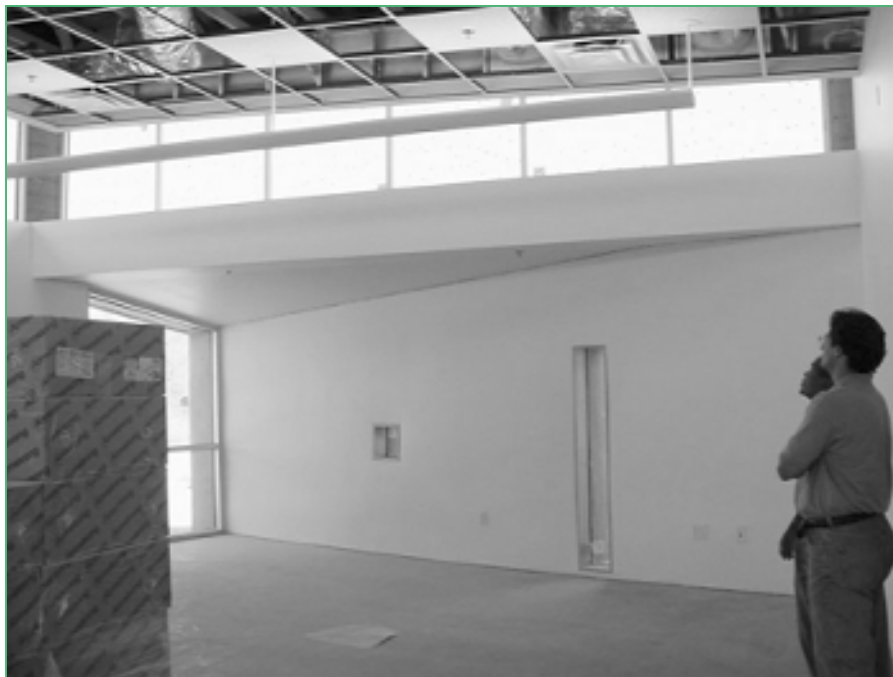
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Inspection Process

In 1999, the program hired its first green building inspector. As far as we know, this position was the first of its kind in the state of Arizona and was funded by the Inspection Services Department. The part-time contract position was later upgraded to a full-time contract position. The Inspection Services Division has been very supportive and open to exploring opportunities that green building could offer in adding value to inspection services and the citizens of Scottsdale.

In 2002, due to budget constraints, the Green Building Program lost the green building inspection position. However, the city Inspection Services Department provided an enthusiastic building code inspector to serve as the lead green building inspector. In line with the city's effort to fully integrate the green building process, all of the building inspectors became responsible for performing green building inspections as part of their regular code inspections. By the fall of 2003, green inspection call numbers have been assigned and correlated as part of the regular code inspection process.



City Building Inspection of a Commercial Facility

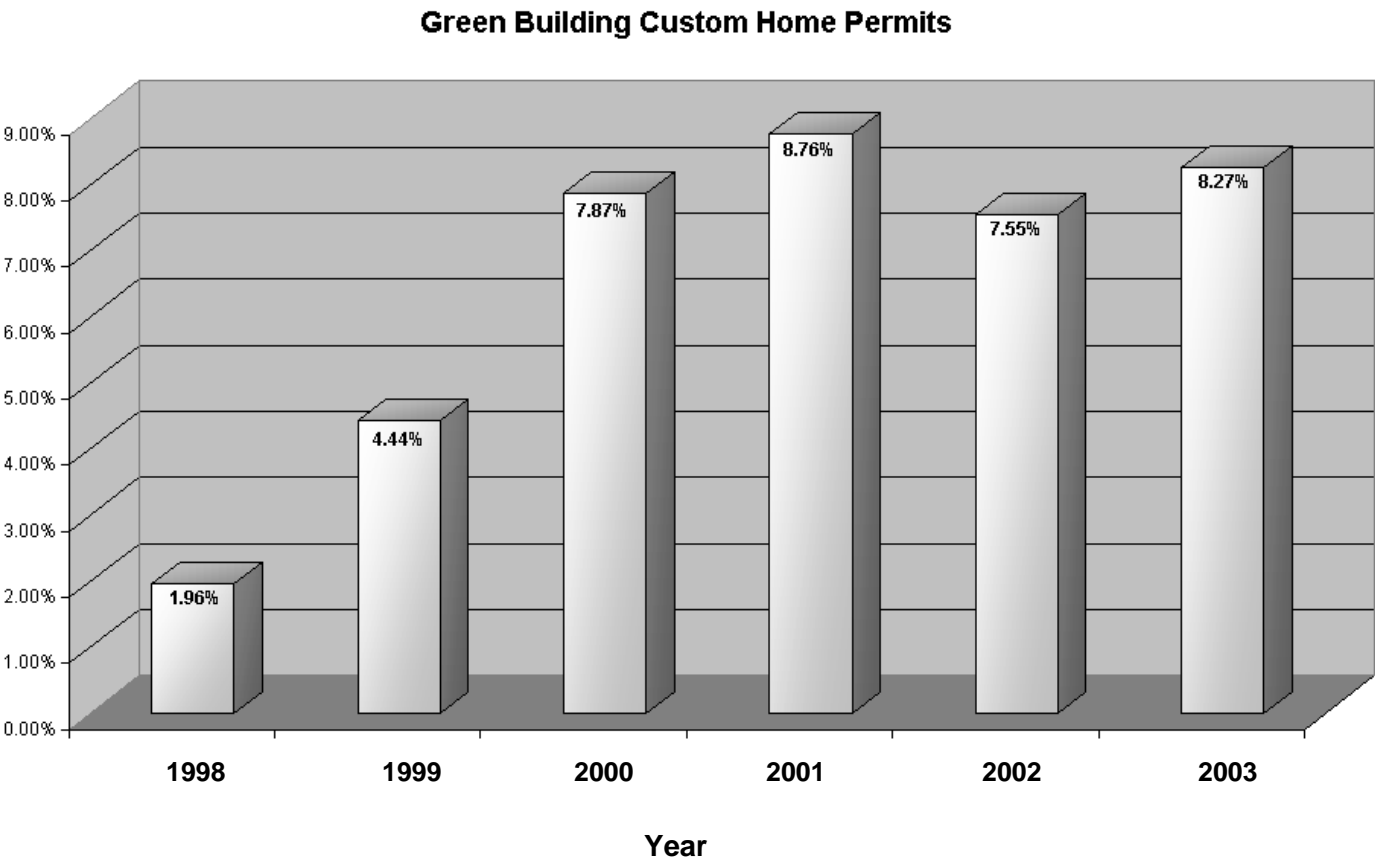
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PROGRAM MEASURES

Building Permit Activity

The majority of green built projects have been custom homes. The following chart depicts the increase of Green Building Permit activity in the Scottsdale custom home market since 1998:
(Details on page 13 and in Appendix B, C, and D)



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Permit Activity for Custom Residential Projects			
Year	Total Single Family Custom Building Permits	Green Building Permits	Percentage of Total Permits
1998	766	15	1.96%
1999	563	25	4.44%
2000	521	41	7.87%
2001	411	36	8.76%
2002	384	29	7.55%
2003	423	35	8.27%
2005			20% (projected)
Permit Activity for Standard Plan (Production) Residential Projects:			
Year	Total Single Family Standard Plan Building Permits	Green Building Permits	Percentage of Total Permits
1998	1406	5	0.36%
1999	991	11	1.11%
2000	775	0	0.00%
2001	555	2	0.36%
2002	432	4	0.93%
2003	473	3	0.63%
2005			10% (projected)
Permit Activity for Commercial Projects			
Year	Total Commercial Building Permits	Green Building Permits	Percentage of Total Permits
1998	182	0	0.00%
1999	145	0	0.00%
2000	90	3	3.33%
2001	89	5	5.62%
2002	50	1	2.00%
2003	80	2	2.50%
2005			10% (projected)

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Outreach and Public Events Activities

Over the past five years, there has been a growing level of activity in the state of Arizona involving energy related and environmentally responsible building. All of these activities reflect Scottsdale's effort to promote green building on a local and regional basis. Every month there was at least one green building presentation made in a public forum or to a professional association meeting.

Green Building Workshops	
The Green Building workshops were organized around the six components of the program, which are site use, energy, water, building materials, indoor air quality, and solid waste. Collectively, the workshops involved over 300 individuals consisting of builders, designers and the home buying public. The workshops were designed as a collaborative venture, involving presenters from the private sector, governmental agencies, Arizona State University and the University of Arizona. These events have exposed green building to a wider audience and attests to the tremendous amount of local and national interest in green building.	
<i>Workshop Date</i>	<i>Estimated Attendance</i>
February 20, 1998	50
June 18, 1998	135
October 22, 1998	120
June 17, 1999	162

Green Building Outlooks	
The purpose of the Green Building Outlooks was to raise the level of awareness of the general public on the sensitivity of our Sonoran Desert environment and the benefits associated with environmentally responsible building; including practices, materials, and products. A special morning workshop was held for builders and designers on diagnostic testing for healthy and energy efficient homes. Keynote speakers and other presentations relayed valuable information and over 40 exhibitors displayed numerous environmentally responsible materials and products.	
<i>Outlook Date</i>	<i>Estimated Attendance</i>
November 6, 1999	200
November 4, 2000	400

Building Performance/Healthy Home Seminar	
The Building Performance/Healthy Home seminars provided tips for homeowners on what to look for to get a comfortable, healthy, energy-efficient home. APS and the State Energy Office co-sponsored this event. John Tooley, a nationally renowned speaker and home performance expert, lectured on the strategies for energy efficiency through a tight building envelope and balanced air distribution system.	
<i>Seminar Date</i>	<i>Estimated Attendance</i>
March 9, 2000	80
July 20, 2000	80

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Green Building Forum

The purpose of the forum was to build upon the growing interest in sustainable development and environmentally responsible building while generating awareness for a healthier future. In attendance, over 240 people from around the valley including, architects, building officials, developers, builders, and real estate professionals. This event was co-sponsored by the cities of Phoenix, Scottsdale, and Surprise.

<i>Forum Date</i>	<i>Estimated Attendance</i>
April 12, 2002	240

Green Building Expo

The Green Building Expo, co-sponsored by the cities of Phoenix and Scottsdale, exposed green building to a wider audience and attests to the growing regional interest in environmentally responsible and healthy building practices. The event featured keynote speakers, workshops, and green building projects that have effectively integrated energy/resource efficient design principles and exhibitors with environmentally responsible building products.

<i>Expo Date</i>	<i>Estimated Attendance</i>
October 4 and 5, 2002	2200
October 3 and 4, 2003	2500

Green Home Tours

The purpose of the home tours, often in association with the Arizona Solar Energy Association [ASEA], was to showcase homes and commercial projects in various stages of construction that use various building systems. Projects have included construction systems such as wood, insulated masonry, ICF, steel, and straw bale.

<i>Home Tour Date</i>	<i>Estimated Attendance</i>
October 24, 1998	200 total
November 7, 1999	100 total
October 21, 2000	100 total
October 27, 2001	100 total
October 18, 2003	100 total



Photos from Workshop and Home Tours

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Green Building Lecture Series

The monthly Green Building Lecture series covers a variety of green building topics. Each lecture one of the many subjects that demonstrate energy and resource efficient, healthy, and environmentally responsible building practices. The lectures are generally held from 7 to 9 p.m. on the first Thursday of each month, for 10 months each year

<i>Lecture Season</i>	<i>Estimated Attendance</i>
2000 (October 4 kick-off lecture)	400 total
2001	600 total
2002	670 total
2003	650 total

Sonoran Solar Lecture Series

The goal of the lecture series is to educate the general public and design community about the benefits of solar in a variety of passive and active applications. The series presents a variety of topics regarding solar and renewable energy utilization, including design approaches. The lectures were held from 7 to 9 p.m. on the second Wednesday of every month, 12 months per year, culminating in October.

<i>Lecture Season</i>	<i>Estimated Attendance</i>
1998 (December 9 kick-off lecture)	25 total
1999	300 total
2000	300 total
2001	300 total
2002	300 total
2003	300 total



Photos from Lectures and Workshops

Desert Green Series on City Cable 11

In the fall of 2002 and spring of 2003, the Desert Green program series was created by City staff members Jay Chapman and Sara Uribe. The program involves filming green building experts, events, and projects and combining them in a way that is beneficial for public education. This cable series also helps to promote the Green Building Program and its ideals. This series is currently airing on Sunday afternoons and evenings on Scottsdale Cable 11 (subject to change).

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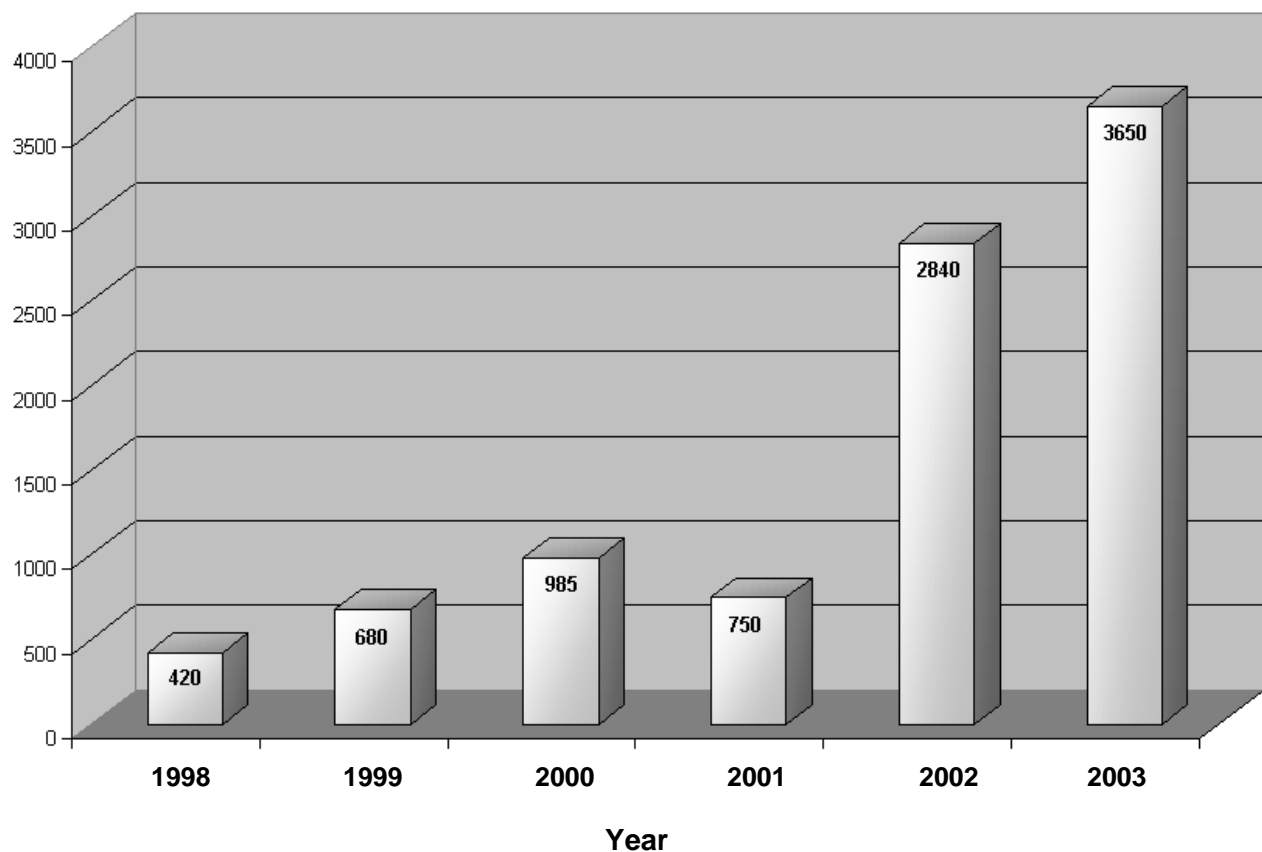
Green Building Course at Scottsdale Community College

Starting in 2000, a course entitled “Environmentally Responsible Building” was developed and conducted at Scottsdale Community College (SCC); thus far, this course has been offered a total of seven semesters. This course was collaboration between the SCC and the Green Building Program. Anthony Floyd designed and has instructed the course to provide an overview of environmental design concepts and building strategies. Topics include climate and geography, sustainability, renewable energies, water use and energy, resource efficiency, building materials, indoor air quality and waste reduction.

Outreach Participant Progress

Scottsdale citizens have demonstrated an increasing interest in educational activities offered by the Green Building Program. The chart below shows event attendance from 1998, including last year's successful Green Building Expo event.

Annual Participation in Green Building Events



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Community Recognition and Awards

2000 Valley Forward Environmental Excellence Award – On September 8, 2000, Scottsdale's Green Building Program received this award for its education programs and marketing strategies to encourage builders to incorporate environmentally responsible practices and features into their projects.

2000 Construction Specifications Institute's Environmental Sensitivity Award – On June 22, 2000, at CSI's national conference in Atlanta, this award was presented to the city in recognition of the program's ongoing efforts to promote environmental awareness in the construction industry.

1999 Governor's Energy Efficiency Award – On November 18, 1999, the Arizona Governor's office presented Scottsdale's Green Building Program a second place award for its partnerships with homebuilders on projects incorporating energy conservation features and for its public workshops promoting a whole-home approach to conservation.

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PROGRAM EVALUATION

The Green Building Advisory Committee and staff continually evaluate the effectiveness and attributes of the Program. This has been crucial to its continued development and enhancement. External evaluations can provide information from new perspectives and stakeholders. During 2002 and 2003, the Green Building Program was reviewed by three external sources.

In the fall of 2002, Kathleen Hemenway, PhD, conducted an independent analysis of the effect of the Scottsdale Green Building Program on five impact areas: Energy Use, Resource Conservation, Indoor Environmental Quality, Water, and Site Use. The Green Building Rating Worksheet the program uses emphasizes these impact areas by the weighing of points for each category of items. However, it was not known which impact areas the builders, architects, and project owners were collectively emphasizing through their selection of items on the rating worksheet. Using methodology typical of program analyses, Dr. Hemenway found that, indeed, the "results indicate a synergy between the Scottsdale Green Building Program and the natural focus of builders in a desert climate, as well as a synergy with the energy use reduction goals of the City of Scottsdale" (Hemenway 2002).

During the fall of 2002 and spring of 2003, two independent graduate students pursued their thesis project on the evaluation of green building programs.

"Shades of Green", the master's thesis by Nathan Engstrom (University of Texas – Austin), compares Green Building Programs nationwide and categorizes them based on factors involving origins, objectives, structures, processes, and standards. According to Engstrom, once it is understood that definitions of green are wide and varied it can be understood that these definitions are contextual in nature and contingent on many disparate factors⁵. Scottsdale's Green Building Program, among the thirteen other programs, was chosen because of use of rating tools or checklists that implicitly serve to define "green" in concrete ways for new single family residential construction.

Scottsdale's program is designated "Deep Green" because of its whole systems approach to building and its regulatory capacity. In addition to efficiency, strategic thinking, and long-term solutions to cost, quality, health, safety and environmental quality issues Deep-Green represents the front line of efforts to alter the collective definition of good building⁶. Other programs receiving this designation include the Austin Energy Green Building Program and Boulder Colorado's Green Points Program.

"Municipal-based Green Building Programs", the master's thesis by Eric Hove (University of Massachusetts – Amherst), provides a comparative study of the Green Building Programs of Scottsdale, Arizona and Boulder, Colorado. Program development, implementation, and evaluation of the programs were analyzed and compared.

After studying the two programs, key components for an effective 'green building' program are identified in an effort to aid other cities and towns interested in creating their own green building program. The two significant recommendations for the Scottsdale program are stronger incentives for developers and better tracking/estimating of the mitigated environmental impacts of "green" projects⁷.

⁵ Engstrom, Nathan. (2003). *Shades of Green: Green Building Rating Tools and the Logics they Represent*. The University of Texas: Austin.

⁶ Engstrom, Nathan.

⁷ Hove, Eric. (2003). *Municipal-based Green Building Programs: A Comparative Case Study of Two Residential Programs*. The University of Massachusetts: Amherst.

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APPENDIX A

Budget History				
Throughout the course of the program, secretarial support has been provided by various city departments, including Planning, Environmental Services, and Project Review (plan review). Following is a summary of the Green Building budget from 1997 through 2003.				
Year	Budget	Description	Staff Positions	Notes
1997/98	Absorbed by building plan review budget	printing, supplies, conferences, subscriptions, memberships	program manager	wage funded by building plan review budget
1998/99	Absorbed by building plan review budget	printing, supplies, conferences, subscriptions, memberships	program manager; part-time inspector (2 positions total)	wages funded by building plan review and inspections budget
1999/00	\$16,984	printing, supplies, conferences, subscriptions, memberships	program manager; full-time project coord./inspector (2 positions total)	wages funded by building plan review and inspections budget
2000/01	\$154,644	wages, printing, supplies, training, conferences, subscriptions, memberships	program manager; full-time project coord./inspector; part-time summer intern (3 positions total)	
2001/02	\$161,074	wages, printing, supplies, training, conferences, subscriptions, memberships	program manager; full-time project coord./inspector (2 positions total)	revenue account established for promotion and education
2002/03	\$162,862	wages, printing, supplies, training, conferences, subscriptions, memberships	program manager; full-time summer intern; part-time fall/winter/spring intern (2 positions total)	\$6,500 generated from green building expo for promotion and education

APPENDIX B

Projects by Building Types

Single Family Residential Custom - 181 permits (1998-2003)

Single Family Residential Standard (production homes)

- Classic Stellar Homes, VIP Homes - 25 permits (1998-2002)
- Columbia Communities, Las Piedras at Sevano Village (64 homes for the period 2004-2005)
- DC Ranch Planning Unit 1 (824 residential units for the period 2004-2006)
 - Monterey Homes
 - Maracay Homes
 - Engel Homes
 - Ashton Woods Homes
 - Artisan Homes
 - P.B. Bell & Associates

Multi-Family Projects

- Loloma 5 Townhomes (5 units - permit issued in summer 2003)
- Silverleaf Golf Villas (16 units - permit expected in 2004)
- PB Bell Apartments (202 units - permit expected in 2004)

Innovative Green Technology

- Beaulieu Residence (permit issued in Fall 2003)
 - Hydrogen Energy, Passive Cooling, Modified Outdoor Microclimates, Integrated Building with Site

Residential Remodeling and Additions - 7 permits (2000-2003)

Commercial and Tenant Improvements (2000-2003)

- Pinnacle Presbyterian Church
- Foothills Academy
- At One Yoga
 - Scottsdale Studio
 - Grayhawk Studio
- DC Ranch – Silverleaf Sales Office
- Las Piedras Recreation Center (permit issued in early 2004)
- Papago Buttes Church of the Brethren (permit expected in early 2004)

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APPENDIX C

Builder Participation							
Participating Builder or Owner	1998	1999	2000	2001	2002	2003	Total
Advanced Concepts		1	1				2
Allen, Jay				1			1
Allie, Greg & Virginia			1				1
American Eagle			1				1
American Solar Electric						2	2
Arroyo Verde Development					2		2
Aztec Estates					1		1
Becker, Perry			1				1
Beringer Fine Homes Inc.						1	1
Mark & Lynn Brachtly						1	1
Calvis Wyant Homebuilders Inc.				2	2	6	10
Carlson Homes LLC					1		1
Centurian Dev. & Invest. Inc.				2	1	2	5
Circle H. Construction Co.							0
Classic Stellar Homes Inc.	11	13	8	8	5		45
Cliftwood Homes	1						1
Coffin, Tom & King, Julie				1			1
Barry Cohen						1	1
Columbia Communties Inc.						3	3
Construction Zone Ltd.				4		1	5
Dallas D. Schmidt Development	1						1
David Arita Construction						1	1
Dick Lloyd Custom Homes Inc.						1	1
Dotty & Sons Inc.				1			1
Dreamquest Homes, Inc.			1				1
Drexler Companies				1			1
Dwyer Custom Homes Inc.				2			2
Edwards Design Group	2	1	3	1	2	2	11
Elam		1					1
GBL Enterprises			1	1			2
Gemini Development					2		2
Golden Heritage					1		1
Golden Vista Construction Corp.	1	3	1			1	6
Gravatt, Rodney				1			1
Grieb, Don			1				1
Heller Contracting	1	1	1				3
Homes & Son Contractors Inc.				5			5
Glenn & Tracy Hughes						1	1
Hustead		1					1
J C and Sons				1			1

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Participating Builder or Owner	1998	1999	2000	2001	2002	2003	Total
J. Ross Construction						1	1
Kelly Custom Homes LLC.			1				1
Kitchell Contracting Inc.			2	1			3
Kitt Construction					2		2
Konenko			1				1
Koshari Dev.				1			1
Landmark Building Consultants			4			1	5
Lithicum Custom Builders					2	1	3
LPC Design and Build							0
Mark V Construction Inc.			1	1			2
McAdams Development						1	1
McDonnell					1		1
Monument Homes Inc.				1	2	1	4
Monterey Homes Inc.						1	1
Neidhart Enterprises							0
Nicholson Investments					2		2
Odyssey Homes LLC				1	2	1	4
Optima Development						2	2
P & C Development			1				1
Pacific Dev Con, Inc.						1	1
Peters, Robert				1			1
Peterson Development and Consulting						1	1
Piccione Construction Inc.			1				1
Platinum Homes					1	3	4
Preferred Building Systems						1	1
Quinn Homes					1		1
Rainmaker Construction			1				1
Redden Construction Inc.			1				1
Rhino Enterprises, Inc.			1				1
Rose Development						1	1
S&S Home Builders					1		1
Salcito Custom Homes Ltd.					1	1	2
Schloz, Stan & Mary					1		1
Select Valley Scapes				1			1
Sever Group					1		1
Irwin S. Siegel						1	1
Sloan Homes	1		1				2
Solid Rock Construction				1			1
SpitFire Builders Inc.					1		1
SRC Homes					1		1
Stenjem Builders Inc.				1			1
Stotts Construction			1				1
Stripling Warriors Contractors			2				2
Sun Valley Masonry							0

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Participating Builder or Owner	1998	1999	2000	2001	2002	2003	Total
Terra Firma LLC				1	1		2
Tierra Building	2						2
Toll Construction					1		1
Tom Archer Custom Homes				1			1
Tom Norris Homes		1	2	2	1		6
Tuscan Estate Homes Inc.			1		1		2
Tyson Development		1	1				2
Tyson Crews Development						2	2
Valenza Development				2			2
Ventana Custom Homes				1			1
Veston Builders					1		1
VIP Construction Inc.		9					9
Wilcoxson, Rick					1		1
Wolf Environmental Inc.	1	1	1				3
Zachary Custom Homes				1			1
Total	21	33	43	48	42	43	230

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APPENDIX D

Designer/Architect Participation		
Adams	GER Drafting Services	Oz Architects
American Solar Electric	Golden Heritage Homes	Perlman Architects
Arch Werks Inc.	Graffin	Plans by Dean Brosos
Archi-CAD	Griffin Design	Productions in CAD
Archicon	H&S Design International	Pulte Homes
Architecture Plus Ltd.	Haven Design	Quinn Homes
Architekton	Hayes Architecture/Interiors	R.J. Bacon Company
Arizona Homes	Hunt Architects	Randall Ewers Associates Inc.
Avant	Image West Designs Inc.	RE Reeds Creative Shelters
Baldingen Architectural Studio	J. Barry Moffitt	Roberts/Jones Associates
Berka Design	J. Michael Cook-Architect	Ross Design
Bingham Engineering	James Ashbel Rogers Inc.	Sara T Designs
Blossom Design Group	James Hann Design	Scannell Architects
Bob Long	JBME LLC	Scheurer Architects
Burke Designs	Jerry Torr	Scrivner Design Group
Calvis Wyant Luxury Homes	Joanne Connelly	Shelby Wilson
Chipley Architecture	Joe Schneider	SHJ Studio
Christina Enciso	John Sjobring	Simpson Design Associates LLC
Christy Wareing Architects	Jones & Mah Architects Corp.	Soloway Designs
Cimarron Custom Homes	Kelly Braswell Designer	Something Special, Inc.
The Construction Zone	Ken Brown Assoc.	SRC Custom Homes
Crane Associates	Kottke Architecture LTD	The Stephen-Jon Design Group
Cunningham Group	Landa & Associates Inc.	T.I. @ Promenade
David Hovey	Landmark Builders	Tafoya Associated Architects
Desert Ridge Design/Andrew Baubel	Lifestyle Designs Architecture	Taliesin Architects
Design Barbarians	Linc Taylor Design Co.	Tammy's Drafting
Donald M & Inge M Duncan	Linderoth Associates	Tasc Architects of Arizona Inc.
Doug Rusk	Mark Williams	Terra Firma LLC
EC Design and Drafting	Matthew Krainski	The CAD Pro Inc.
The Edwards Design Group	Miller Associates	Tom & Mary Van Dyke
Encore Design Group	Monument Homes Inc.	Tom Norris
Espacios	MPC/Davanaugh	Tristan Andrew Debruin
Ewa Grabowski	Nessler	TRK Architecture
Fez Architecture Design	New Home Design	Troon Builder Estates
Fonce Architecture	Newgebauer Architecture Design	Von Fange & Associates
Frank Clemente	NOA Architecture	Weddle & Gilmore Architects
Fulton Architects	Omni Graphics	Will Bruder
George Christensen	Optima Development	William Down & Associates

SCOTTSDALE GREEN BUILDING PROGRAM

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APPENDIX E

Comments from the 1998 Green Building Advisory Committee (on the Future of the Scottsdale's Green Building Program)

Deborah Coburn, Healthy Housing:

"The Green Building Checklist and Rating System is in place to expand into the residential remodeling industry. With all the older homes available for upgrading to energy, resource efficient and low-toxic standards, I think that this is an area that could be a natural extension for the existing Program."

Paul Decker, Decker Homes:

- Encourage consumers to consider the effects that our buildings are having on our environment
- Continue to gather & disseminate information on Green Buildings, product systems & design
- Continue to promote the concept of sustainability
- Broaden our base of builders to include track & the larger semi-custom builders
- Provide education, monetary incentive & publicity for the builders in the program

Tom Hahn, Assistant Professor, School of Architecture, ASU & President, Sol Source, Inc:

"... the Program has come an extremely long way toward its initial goals very fast. It seems a very comprehensive program that sets a reasonably high threshold, without being too easy for the average builder to achieve without some thought and commitment. As it stands, it creates an awareness and appreciation for green building and, by its certification, gives value to homes built in this way."

"... the City administration should consider this a valuable Program and should consider it worthy of its support. The Program needs support documentation, brochures, a newsletter and marketing materials. The Program cannot be successful if no one knows about it. Its only real hindrance is recognition by the greater building community, and that can be overcome in large part by having the resources to share information about the Program."

Denny Miller, Omni Block:

"For the program to continue to prosper and have a continuing affect on the building community, several areas need to be addressed. I agree with some of the other members of our acting committee that builders should be in the program for the reason that it is the socially responsible thing to do. The planet cannot sustain the current raw material usage indefinitely. Unfortunately, this country is a capitalistic society and competitive market..."

Beverly Westgaard, Arizona Department of Environmental Quality & Arizona Environmental Strategic Alliance:

"Great stride and model for the valley. The Arizona Environmental Strategic Alliance and the Arizona Department of Environmental Quality (ADEQ) have endorsed the Scottsdale Green Building Program as a model program for Arizona residential builders. The Alliance and ADEQ will continue to promote this program as an active educator and partner in sustainable decision making for the building industry..."

Richard Zimmerman, AZ Sunshine Publishers:

"Thank you for the opportunity to be involved in developing Scottsdale's Green Building Program. Our program has drawn national attention."