

World Habitat Awards 2008

Final stage submission for Earthsong Eco-Neighbourhood



Submitted by Earthsong Eco-Neighbourhood and the Earthsong Centre Trust.

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Appendices

– Site plan, building floor plans and elevations

– HERS assessment, Home Energy Comparison, Home Water Use Comparison, Rubbish Comparison, Earthsong Landuse and Usual Landuse Comparison.

– Selected articles

– Pp 38, 39, & 181 – 183 of “A Deeper Shade of Green – Sustainable Urban Development, Building and Architecture in New Zealand” edited by Johann Bernhardt, Balasoglou Books, Auckland 2008.

– Chapter 10 of “Sustainable Community – Learning from the Cohousing Model” by Graham Meltzer, Trafford, 2005.



Organisations making the submission

Earthsong Eco-Neighbourhood is a cohousing neighbourhood planned and developed by its members, the cooperative group of prospective residents. This group was formed in 1995 and gradually grew in numbers as people were drawn to the vision and wanted to be part of planning, and ultimately living in, this intentional neighbourhood. Several years of research, planning, group building, and increasing membership led to the purchase of the site in 1999. The group then entered an intensive period of participatory design and setting up of the financial and legal structures to enable commencement of construction in late 2000. Construction was completed in stages over eight years, with final completion in July 2008.

Now that construction is completed and all homes are occupied, the members and residents of Earthsong continue to work together to manage the ongoing running and development of the neighbourhood.

In order to advance the educational aspects of the Earthsong vision, a charitable trust called the *Earthsong Centre Trust* was established in 2004, with trustees drawn from both unit owners of Earthsong Eco-Neighbourhood and the outside community. The *Earthsong Centre Trust* now jointly owns, with Earthsong unit owners, the large community building at the heart of the neighbourhood known as both the Earthsong common house (for residents) and the Earthsong Centre (for the Trust). The *Earthsong Centre Trust* manages the outreach activities of the neighbourhood that contribute to education of the general public in issues of social and environmental sustainability such as site tours, workshops, public talks and other events, and the Earthsong website.



Project context

In New Zealand, as in most developed countries, conventional settlement patterns of towns, suburbs and neighbourhoods promote both isolation and high resource use.

Largely developed after the advent of motorised transport, existing cities and suburbs require continued high use of transport fuels to function. With a poorly developed public transport system in New Zealand, most people need to use their cars to reach shops, schools and workplaces, and this, as well as creating all the negative environmental consequences, also reduces interaction and interdependence between neighbours. Each household operates as an independent unit. This prevailing culture of individualism has led to a corresponding feeling of isolation and alienation by many people living without the support they really need, including single people, young families, older people and others less able for whatever reason.

In addition, standard New Zealand house design, construction materials and services pay little regard to minimising the negative impacts on the environment either from the construction or the ongoing life of the building, including energy and water use, and production of waste and pollution. The construction industry as a whole is one of the highest users of resources and energy of any industry, and produces some of the worst pollution. There has been much information and knowledge in the building industry for many years about how to design and build healthier, more energy efficient, less environmentally damaging housing, but examples of this information being used in practise have been very rare in New Zealand.

Earthsong Eco-Neighbourhood came about from a deep commitment to address both of these issues by building a more socially and environmentally sustainable neighbourhood.

Partnerships

While a wide range of individuals and organisations have been involved in providing advice, services or other assistance, this project has been planned, developed and led by the members of *Earthsong Eco-Neighbourhood*. All decisions relating to design, planning, development, financing and ongoing management are made by consensus of the full group.

The official development entity, formed in 1999, is a non-profit company called Cohousing New Zealand Ltd (CNZL), with the shareholders being all financial members of *Earthsong Eco-Neighbourhood*. The ongoing management of the neighbourhood is by way of the Earthsong Body Corporate, consisting of all unit proprietors. The ongoing educational objectives are managed by the *Earthsong Centre Trust*.

We have a close and supportive relationship with the local authority Waitakere City Council, signing a Memorandum of Understanding with them in 2003 that recognises *Earthsong Eco-Neighbourhood* as a key partner in relation to the Council's Eco-City policy, with a wealth of experience that supports and demonstrates the Council's objectives. Their loan for the Earthsong Centre demonstrated their recognition of the benefits that that facility would bring to the people of Waitakere and greater Auckland.

Project description

General information

Main purpose of the project

To develop and demonstrate socially and environmentally sustainable housing. This is best illustrated in our Vision Statement, written in 1995 and a continuing source of inspiration for us.

Earthsong Eco-Neighbourhood vision statement

Our vision is to establish a cohousing neighbourhood, based on the principles of permaculture, that will serve as a model of a socially and environmentally sustainable community.

Within this vision our aims are:

- To design and construct a cohesive neighbourhood whose layout, buildings, and services demonstrate the highest practical standards of sustainable human settlement
- To develop and foster a living environment which uses clear communication, decision-making and conflict resolution guidelines that promote tolerance, safety, respect and co-operation
- To assist in education and public awareness of sustainability by demonstrating and promoting innovative community design and environmentally responsible construction.





Key features:

Earthsong Eco-Neighbourhood is a 32 home cohousing neighbourhood on 1.29 hectares in the suburb of Ranui, Auckland, New Zealand. Cohousing communities are small-scale neighbourhoods whose central purpose is to build more meaningful social relations. Cohousing counters the isolation and impracticalities of single-family houses on separate lots by combining the autonomy of private dwellings with the advantages of community living. Each household has a private, self-contained residence, but also shares extensive common facilities, including a large common house, with the larger group.

The common house and associated common open space form the ‘heart’ of the neighbourhood, and are placed at the focal point of the site. The common house is owned jointly by all house owners and supplements the individual dwellings, providing a gathering and community place for the residents. Common meals are available two nights a week in the common house, providing a welcome option to residents with busy lives who choose to eat with their neighbours. By sharing facilities with other households, facilities can be provided beyond what is normally achievable by individual owners.

Clusters of two and three-storey attached dwellings are arranged along the common pathways and shared courtyards to facilitate a sense of belonging and identity within the larger neighbourhood. The natural shape and form of the site has been retained, with houses stepping gracefully down to the main central path. Many old fruit trees, retained from the original orchard, provide character and continuity with the history of the site.

The site layout and building design are based on strong principles of environmentally sustainable design, material selection and services, working in with the existing landform, vegetation, and climate to create a beautiful and flourishing ecosystem.

One of the key features of Earthsong is that it has been initiated, developed, funded and managed by ordinary individuals who wanted to make a difference, to live in a more cooperative and environmentally sustainable way and to share what they learned with others. This is described more fully below.

Construction was completed in July 2008. The focus has since been shifting towards refining ongoing systems of community and services management, more intensive food growing, developing the educational and outreach activities, and becoming more involved in the wider community regeneration.

Main beneficiaries of the project

A key motivation for developing this neighbourhood was to trial and demonstrate a more sustainable urban neighbourhood model. While the owners and residents are the immediate beneficiaries, we at Earthsong believe the biggest contribution we can make to global sustainability is to build a neighbourhood in an urban location that demonstrates the highest practical standards





of sustainable human settlement (both socially and environmentally), and to share what we have learnt with others through presentations, media articles, the website, and invitations to visit. The construction of a model is crucial to wider knowledge and implementation of more sustainable practises in housing developments. Many people from all sectors of society find that visiting Earthsong is an inspirational experience.

Through the *Earthsong Centre Trust* we are committed to sharing the knowledge and experience of sustainable design and community empowerment with the public. The Earthsong Centre is a venue for courses and educational tours run by the trust, and is also available for meetings and events run by local interest groups and organisations that are compatible with the charitable, community and environmental objectives of the trust. Over 80 such events occurred last year, and this is expected to grow as the Trust develops a full educational programme.

Earthsong has also been a catalyst for community regeneration in the surrounding suburb of Ranui, and members of Earthsong are working with other local organisations to plan the redevelopment of the commercial suburban centre, as described later.

Financial information

Capital costs and how met

Earthsong has been developed entirely by the future owners and residents on a non-profit basis, with house prices set to cover the development costs. Apart from the grants listed below for specific aspects of the project, the houses have therefore been 100% funded by the purchasers.

The common house/Earthsong Centre is owned equally by Earthsong owners and the *Earthsong Centre Trust*, and has been funded 85% by house owners (built into the house prices) and 15% by outside grants and donations to the Trust.

The capital costs of the staged development were as follows, with costs of each stage as paid at the time:

- Stage I (constructed 2000 – 2002): 17 houses and major siteworks. Development cost \$NZ 4,850,000.
- Stage II(a) (constructed 2004): 7 houses and associated siteworks. Development cost \$NZ 1,920,100.
- Common house/Earthsong Centre (constructed 2005). Development cost \$NZ 1,402,000.
- Stage II(b) (constructed 2006): 8 houses and associated siteworks. Development cost \$NZ 2,369,000.
- Completion of site works (2008): Development cost \$NZ 187,200.

For each construction stage, the purchasers provided 20% of the equity required up front with the balance provided by commercial construction loans from the National Bank of New Zealand. New Zealand's small ethical lender Prometheus Ethical Finance provided finance to both the company and individuals where possible.

Grants

We have received financial assistance for specific aspects of the project as follows:

- The ASB Community Trust granted \$203,000 to the *Earthsong Centre Trust* in 2005 to assist with construction costs of the Earthsong Centre.
- Waitakere City Council advanced an interest-free loan of \$300,000 to the *Earthsong Centre Trust* in 2005 towards construction of the Earthsong Centre, in recognition of the community benefits of this facility and to allow the construction of this building before the completion of the houses.
- Waitakere City Council paid \$10,000 being half the costs of the installation of the demonstration composting toilet in 2005, in order to monitor and demonstrate the feasibility and benefits of installing composting toilets in an urban area.
- Auckland Regional Holdings Ltd (formerly Infrastructure Auckland) granted \$93,400 in 2001 towards the cost of the innovative overland stormwater system, specifically the water tanks, swales, pond and permeable paving.

Ongoing revenue and funding

Earthsong Eco-Neighbourhood is fully self-funded through annual Body Corporate fees by householders.

The *Earthsong Centre Trust* charges fees on a sliding scale for educational tours, events, and use of the venue by other organisations. Higher-paying users subsidise low and non-paying users, with an overall small annual income to the trust to go towards maintenance and running costs. It is likely that Earthsong owners will continue to pay for the bulk of future costs of the venue, including furniture and fittings, although grant applications will be made for large items specifically for use by the educational events.



Social sustainability and community empowerment

- Earthsong has been developed from the beginning by the cooperative group of prospective residents, who have worked together to create the legal structures required, design the buildings in collaboration with the architect, fund the construction, and are now managing the ongoing maintenance and development of the neighbourhood.
- All decisions are made by consensus of the full group of members using a powerful and simple method using coloured cards that allows all members to participate fully.
- Members are those people who have completed the membership process, designed to ensure that individuals fully understand the vision and agreements of the group, and once having fulfilled these steps, have chosen to be part of the group i.e. there is no selection process; it is the individual's choice, not the group's, whether they become a member or not.
- A key concept from the beginning has been the balancing of the needs of the individual and the community to enable both to flourish. This has been incorporated in all aspects of the project, from house and site design to ownership structure and decision-making.
- One of the first agreements made in the group was to establish clear communication agreements, meeting and decision-making procedures, and conflict resolution procedures to keep group interactions clear and effective.
- Diversity has always been a goal in the neighbourhood. A mix of different ages, backgrounds, ethnicities and income levels is encouraged to foster a vibrant and dynamic community. The dwelling types range from 1-bedroom studios to 4 bedroom houses to accommodate a range of ages and household types.

- Seven houses are single level one- or two-bedroom units to accommodate those of limited mobility. All paths are designed to 1:20 maximum gradients to allow full accessibility to all, and most two-story houses have level entry thresholds to their ground floor areas.
- Children's play areas, in addition to the children's room in the common house, include a large sandpit, a playhouse and children's vegetable garden, with other facilities planned. The car-free environment allows safe play in almost all areas of the neighbourhood.
- Teenagers are also supported with the teen room, table tennis and pool table, and teen's outdoor patio by the common house.
- Our suburb of Ranui is a generally low-income area and one of the most ethnically diverse neighbourhoods in Auckland, a fact valued by the Earthsong community. Earthsong residents are involved in paid or voluntary roles in many initiatives within the local community, including the Ranui Community Centre, the Alternatives to Violence Programme, Project Twin Streams (fostering community empowerment by regenerating local streams), Sustainable Ranui (creating a sustainable neighbourhood through building a stronger community), and the Ranui Action Project (improving health and well-being outcomes in the community).





Environmental sustainability

- Private car use is minimised by Earthsong being located close to public transport (train and bus), shops and community facilities.
- The neighbourhood itself is predominantly pedestrian, with cars parked at the edge of the site and a network of paths linking homes.
- All buildings are correctly oriented and designed for energy efficiency and natural climate control using passive solar design. They include both 350 mm rammed earth construction and timber-framed, timber-clad construction, with concrete floors, macrocarpa timber joinery and corrugated metal roofs. Building materials and components were chosen that best fulfilled sustainable architecture criteria, with attention paid to such issues as embodied energy, toxicity, environmental impact, durability and recyclability.
- The use of simple robust materials meant that the skills of the builders were visible and valued, and the construction methods encouraged the builders to refine their skills and take pride in their work. This proved to be much more satisfying than the standard high-volume low-skill technology that relies on fossil energy use and manufactured products.
- Solar water heaters are fitted to all houses and the common house to provide the bulk of hot water needs.
- Rainwater is collected from roofs into tanks and piped back for use within houses. All surface water and the overflow from the tanks flow into planted swales (shallow dish drains) beside the paths, which filter the water and encourage maximum soakage of stormwater into the ground. The swales flow down the middle of the site to discharge into a large pond at the northern end.

- All reusable materials from the two existing dwellings on the site were salvaged and reused, including the matai timber flooring, rimu timber framing reused for furniture, and the old concrete cladding crushed and used for the driveway base.
- Construction waste was greatly reduced over conventional construction as composite materials were largely avoided. Waste was separated at source and reused on site where possible e.g. timber offcuts, ramming earth, and plaster board (used on the garden to break down clay), or taken to the recycling station where possible. Waitakere City Council did a construction waste audit on Stage II(a) which found significantly less waste than for a standard housing project.
- Organic kitchen and garden waste is processed on site using compost bins, worm farms, and the EM bokashi system, for returning to the organic vegetable gardens.
- A collection station near the entrance allows the sorting of metals, glass, plastics and paper for collection and recycling.
- Permaculture (permanent agriculture) is the conscious design and maintenance of agriculturally productive ecosystems that have the diversity, stability, and resilience of natural ecosystems. A comprehensive site design at Earthsong based on permaculture and organic gardening principles includes productive and edible landscaping, native bush and orchard areas, and water management areas.
- Some desired items were not able to be included in the construction phase due to political or financial constraints, including on-site wastewater treatment and photovoltaic panels for the generation of electricity. We have, however, built in such a way as to facilitate these systems being added in the future, and will keep working on the political impediments in order to implement these at a later time.





– All construction is enormously disruptive of the existing environment, but this was minimised wherever possible, and measures taken to ensure the finished neighbourhood has an equal or better environmental footprint than the existing site. The original site was an old neglected apple orchard. Huge effort was taken to save all existing healthy trees, and with care and attention these are now looking better than ever and contribute to the established feel of the neighbourhood. Many new fruit and native trees have been planted and it is planned that the food production from the site will exceed that of the original orchard when these mature. Buildings and paths were designed to fit the shape of the land to minimise excavation or other major earthworks. The stormwater design ensures that the runoff from the site is equal to pre-development for up to a 1-in-5 year flood, and as the trees and landscaping mature this will only improve. Over 60 people now live where only one did before, in a thriving and flourishing community that is nurturing the soil and trees back into health and providing a much greater diversity of plants than previously existed.

Economic sustainability

– Houses were sold to members at the prices required to cover the costs i.e. there was no profit built into the price. This meant that, even though the house prices covered high quality healthy materials, extra features such as the solar water heaters, and a share of the common house and other common facilities, Earthsong houses were priced similarly to standard new houses in the surrounding area.

- The energy-efficient design, passive solar heating and cooling of buildings, solar hot water heaters and other on-site services greatly reduce running costs.
- Residents retain individual financial autonomy, while at the same time enjoy considerable economies of both money and time through co-operation and the shared ownership of various items such as laundry, garden and workshop equipment.
- Formal sharing of tasks, such as the cooking of meals in the common house and organising the organic vegetable cooperative, as well as informal co-operation around such things as childcare and carpooling, all reduce both time and costs to individuals.



- Some rental units are available, and other avenues of funding are being pursued in order to provide further options for lower income members. A Housing Trust has been formed to research and enable affordable housing at Earthsong, looking at the possibility of buying a unit for low rental, or offering low-interest loans to purchasers.
- A “green dollars” system has been developed and encourages members to use each other’s skills.
- The 3900 m2 of land on the front of the site adjoining the main road will be developed by a subset of Earthsong members known as “Walk-to-Work Eco-Developments”, to provide premises for both Earthsong residents and others from the wider community to run eco-friendly

businesses, shops, a café and art gallery. Situated adjacent to the commercial town centre of Ranui, this project aims to complement and link with the neighbouring suburban facilities, contribute to a vibrant suburban centre, and be a catalyst for Ranui to move towards being an “eco-village” within Waitakere City’s Eco-City.

Barriers

The project has been very challenging financially, being funded primarily by ordinary individuals and families on a variety of incomes, who paid all the costs of a pioneering and innovative vision. Years of voluntary effort by members have gone into the planning and management of the development. Some members also worked full or part time in a professional capacity for the project for several years for a very low income.

Without any financial support from either public or private organisations until well into the second stage of the project, the group paid all the costs faced by a normal commercial developer, and in addition paid a premium for the research, development and approval costs of unusual construction methods and eco-friendly on-site services design. However, there is a great strength in a group of people inspired and committed to a vision. The project required sufficient money up front to pay for the site, consultants and other development costs to get the project to the point where individuals could put deposits on their future houses. This was high risk money that needed to be spent to get the project happening. An important step was formulating a legal agreement between members that went some way to equalising the burden and risk and allowed individuals to invest different amounts of money, which collectively meant the project had sufficient funds to proceed.

Balancing the commitment to building leading-edge sustainable buildings with the equal commitment to keep the prices within reach of a diversity of people was a continual challenge, and some compromises were made. Some decisions were made not to incorporate aspects in the initial construction, but make provision for upgrading in the future as money or bureaucracy allowed. One of these was photovoltaic panels on the roofs to generate electricity. The cost of these was high, and with 80% of mains-supplied electricity in New Zealand coming from renewable sources, was felt to far outweigh their environmental or financial benefits. However, cables were installed in the wall framing from the roof space to the electrical distribution board of every house to allow easy retrofitting of the panels at a later time. Similarly, small pockets of land between house rows have been designated as common land to allow later installation of extra water tanks, to increase the available storage and therefore the percentage of water supplied from on site.

Obtaining development funds from a commercial bank was also a huge challenge. As unknown developers, our company Cohousing New Zealand Ltd (CNZL) had to meet a robust set of conditions from the bank regarding valuations, percentage of pre-sales, and guarantees. The first valuations for the houses that were done off the plans were much lower than their expected build cost, as no value was attributed to either the healthy eco-features of the designs or the substantial common facilities we were planning.

The valuations were important for two reasons: a bank would only lend CNZL up to 80% of the total value of the project as a construction loan. If the construction costs were higher than the valuation, that 20% that CNZL had to find as equity became more like 30% of the total costs of the project. We also needed sufficient sales as security for the bank for the construction loan. A low valuation also affected the individual buyers’ ability to get a pre-approved mortgage to buy their house off the plans, and thus the number of confirmed buyers dropped off as the valuation was low and costs rose. At times it seemed that the crucial threads of construction prices, valuations, house prices, house sales, and bank loan would never meet in the middle. Eventually we found a different valuation company that was willing to include the value of the common facilities in the house value. The new valuations were still lower than we believed they should be but were sufficiently close to what we needed that we could move forward.



Other requirements of the bank were satisfied by all the Earthsong members agreeing to be jointly liable, through indemnities and guarantees, for any losses or inability to repay the loan. Again our great strength was the willingness of the group to take the risks together and support each other.

As the project included leading edge design in many areas, professional advice was sought from a wide range of consultants and integrated within the whole. The development costs of pioneering were therefore very high compared with a standard subdivision. Our local authority Waitakere City Council had committed itself to being an Eco-City in 1993, and for this reason Earthsong chose to locate in this council area. However, while the Earthsong concept aligned fully with this eco-city policy and the politicians were generally supportive of what we were trying to achieve, we found that Earthsong bore the financial burden of developing more sustainable systems and proving to the council that they were valid.

One example was our overland stormwater design, which although it was in line with the council eco-city policy and encouraged by the council water supplier EcoWater, was still ahead of their existing Codes of Practise. The council therefore required substantial extra design work and peer review by civil engineers, paid for entirely by CNZL, before they would approve our non-standard system. Waitakere City Council has since recognised this as a major unnecessary impediment, and Earthsong is now being used by the council to educate their own staff about sustainable development, and to encourage other developments to incorporate more sustainable systems.

Another bureaucratic barrier we encountered was from WaterCare Services, the water management body of the Auckland Regional Council, which opposed our application to build an on-site wastewater system. We had a concept design from water engineers that showed it to be technically feasible, but WaterCare's opposition meant that we would have had to take an appeal to the Environment Court, a very costly and time consuming process. We chose not to incur delays by pursuing that at the time, but instead went ahead with installing a standard system of pipework discharging into the existing council sewer. However the network of pipes in the ground are laid in

positions that will make diversion to future installation of on-site wastewater treatment systems in the future relatively easy.

Because we were using non-standard eco-friendly materials and construction systems, we had very limited choice of building contractors of sufficient size to handle the project and with the appropriate skills in rammed earth construction. We used a company well established in building single rammed earth houses, and hired professional project managers to work alongside them and mentor them in the systems required for such a large project. However three quarters of the way through building the first 17 houses of Stage I, the construction company found themselves in financial difficulties (largely caused by previous jobs) and went into liquidation. This was a very serious setback to an already challenging project and CNZL lost a substantial amount of money in delays, complications, and non-delivery of materials already paid for. Fortunately we managed to find other builders willing to finish the Stage I houses, and managed financially by deleting all non-essential items from the new contract and enlisting personal pledges from over 30 friends and relations to cover any shortfall at the end.

The other main area of difficulty and challenge has been in design and construction issues. One consequence of pioneering new techniques to address environmental aspects of construction is that inevitably some mistakes were made as other aspects of the materials were not understood or were overlooked. Two examples are to do with materials incompatibility, one being the accelerated corrosion of unpainted zincalume roofs through copper-laden runoff from the solar panels, the other being corrosion of zinc flashings installed at ground level to protect floor slab insulation in the common house. While the roof issue has been relatively simple to fix, the ground level flashings required substantial research, redesign and expensive replacement. This was a painful process that delayed full completion of the common house by nearly two years, but was eventually solved and repaired.



Lessons

One thing that has shone through again and again in this project is the value of having a committed group aligned with the vision. We've been able to achieve as much as we have in the physical aspects of our neighbourhood not only in addition to a social and cooperative structure, but because of our social and cooperative structure; the two have gone hand-in-hand.

As a group of future residents designing and developing housing for ourselves, we were willing to make design decisions on aspects, important to us, that a developer might find too risky for speculative housing. One example is our car-free neighbourhood: we chose to place a higher importance on our relationships with each other than with our cars. A standard developer might well assume that perhaps the market wasn't ready for this. However, by building a pedestrian neighbourhood and inviting others to experience the benefits, Earthsong is helping to shift this market perception.

The commitment of the group led to Earthsong achieving much more than any one of us individually would have been capable of. We can achieve so much more by working together, because of the combined strength of diverse experience, skills, resources and perspectives to think things through and make informed decisions. We are supportive of and accountable to each other and remind each other of our vision. This group cohesion has certainly been through cycles, but overall the group commitment and vision have been stronger than any particular conflict or difference. The internal cohesion of the group needs regular updating and reinvigorating, especially as the tasks of development are completed and we settle into growing the ongoing life of the community.

With a diverse decision-making group there would be the potential for hugely complicated relationships and miscommunications with outside contractors and advisors such as professionals, contractors, councils, and bank unless one person from the group is mandated to interact with them. We appointed a liaison person, an architect by profession, from within the group who had the role of both a conduit of information in both directions between the group and the outside consultants, and champion of the group's vision in all aspects of the implementation of the project. While there was a strong commitment to full participatory decision-making within the group, during the construction phase the liaison person also needed to have the mandate to make some decisions quickly at times when that was in the best interests of the group and the project.

Building projects can be enormously complex and challenging even when using standard systems and materials, and more so when the design goes outside the norm. In such circumstances there is a continual gravitational pull back to doing things the known and therefore easier way. We have learnt over and over again of the value of having strong knowledgeable leadership representing the client group with outside consultants and contractors, someone who has the skills and background to drive the project, continually to look closely at what was being proposed by outside contractors and ask searching questions, and to keep ensuring that the decisions made by consultants or on the construction site were those that best served the vision.

Another lesson is the importance of behaviour in reducing the environmental footprint. Designing buildings and neighbourhoods to be as sustainable as possible is an important first step, but the behaviour of the occupants is at least as significant when it comes to the overall impact (some studies show behaviour to have twice the impact of the built environment).

One example is with electricity use. The electricity use of individual Earthsong houses varies widely, even for identical houses with similar numbers and ages of inhabitants, because of the habits and behaviour of the residents. Because high individual users to some extent determine the overall cost to everyone at Earthsong, (as the pricing plan from the supplier is determined by our overall use), we have debated this issue on all levels, from the underlying philosophy of pricing formulae to ways people can reduce their electricity use.



A cooperative neighbourhood can facilitate behaviour change through information exchange and education, sharing ideas and tips about how to manage the systems more efficiently, internal pricing plans that reward low users and discourage high use, built-in feedback mechanisms, and accountability through making information on individual house use available to all. All of these mechanisms are in place in some form at Earthsong, with the result that 32 homes and the common house are managing to function with an electricity supply of the size that usually supplies 6 houses in New Zealand.

Other ways that living at Earthsong has affected behaviour are best told in residents' own words:

“Through living at Earthsong I have become aware of permaculture and have seen it work in practice. With the support of neighbours I am now implementing permaculture principles in my garden.”

“My education focused strongly on decision making and producing ‘optimal’ results. Our consensus decision making process here at Earthsong makes me realise how much learning we lose by reducing decisions to numbers and that optimal results don’t exist in social settings. In the beginning I just wanted to get done with the rounds and the meetings, now I value them for providing insight in the thought processes and mindsets of my neighbours.”

“I buy much more organic food for myself because it seems strange to live in a healthy house on a certified organic property and fill the fridge up with non-organic food.”

“I look forward to meetings – even the difficult ones, because I trust that the people here will work it out. I tell people I am living according to my beliefs and values. I think more in group needs than individual.”

Innovation and impact

Key innovative features

- *Earthsong Eco-Neighbourhood* is a powerful “pattern for change”. Not only is it a significant living demonstration of more sustainable human settlement, both socially and environmentally, but the development process itself is a powerful demonstration of what can be achieved through cooperation and commitment.
- The concept of cohousing re-establishes the sense of belonging and relationship with neighbours that is often missing in contemporary life, and deserves much wider implementation. We are the only cohousing neighbourhood in New Zealand to date, although several individuals and groups have sought assistance and advice from us in starting similar cohousing communities elsewhere in New Zealand.
- Physical design that encourages a strong sense of community while safeguarding privacy and autonomy, with many layers and transitions between private and common areas.
- Environmentally sustainable design of buildings, services, and landscape in an integrated whole.
- Decision-making and communication agreements that allowed a group of ordinary people to work together to achieve a major innovative housing development.
- Inclusive development process to maximise empowerment and contributions from all, in stark contrast to the isolation and sense of powerlessness and disconnection of modern suburban life.
- Balance of individual ownership, autonomy and privacy with shared ownership, shared decision-making, cooperation and community.
- Shared community buildings mean that everyone has access to far more than an individual household would.
- Overland stormwater system that turns a waste problem into a resource, reduces the impact on properties downstream, increases biodiversity, and becomes an asset to the neighbourhood.
- Pedestrian-focussed neighbourhood that is safe, peaceful, and quiet, leading to more community interaction and cohesion.
- Ongoing education of residents and building of systems to encourage efficient use of energy and awareness of the issues e.g. power-use charging, water monitoring.

Impact on residents

Residents live in healthy, warm, low-allergy houses, and people with severe chemical sensitivities report much better health since living at Earthsong. Houses have very low running costs, and are naturally much warmer in winter and cooler in summer than the lightweight housing that is standard in New Zealand.

There is a huge sense of ownership through having been part of planning and working towards the completion of the project, and this continues as residents cooperate to plan and establish gardens, orchards and childrens’ play areas. Residents cherish the sense of belonging and satisfaction that comes with working together on shared projects and being part of a caring neighbourhood. It is a very safe neighbourhood, both because of the absence of cars around the houses and living areas, and because neighbours are quick to spot unusual behaviour from people they don’t recognise.

There is much spontaneous sharing of information, working on shared work projects, and informal support networks. The social and environmental benefits of cooperation over gardening, childcare, carpooling, and other activities are significant and observable but haven't yet been quantified.

Ongoing management of shared areas does require time and effort to understand each other and reach agreement, and as with any group of people there are occasional interpersonal challenges that have to be worked through. While these can be uncomfortable and time-consuming, it is part of learning to interact and respect each other. It is challenging learning to work together and make decisions for the common good, and hugely valuable in learning to rebuild interdependence in our individualistic world.

Impact on the wider sphere

While no similar projects have reached an advanced stage of development in New Zealand yet, there has been a lot of interest and recognition. Thousands of people have visited, and there have been many newspaper and magazine articles and appearances on TV over the years. Many people come for site tours, from councils around NZ, national and international tertiary institutions, advisors to local and national government, architects, planners and engineers, students of all ages, and overseas delegations.

Earthsong residents are now shifting their focus from completion of construction to projects with a wider focus. The Walk to Work project on the front of site and the wider redevelopment of Ranui itself, described below, will both build on the example and experience of Earthsong, taking the twin vision of social and environmental sustainability into a commercial town centre context. Earthsong residents are also using the Transition Towns model to build connections with the wider community and help to build greater community resilience and a more flourishing suburban community.

Local and national government policy changes

Earthsong is used as a model and example for various national initiatives, e.g. the TUSC development tool described below. Waitakere City Council reviewed their internal processes regarding unnecessary impediments to environmentally sustainable designs in light of Earthsong experience. Earthsong is now being used by the council to educate their own staff about sustainable development, and to encourage other developments to incorporate more sustainable systems.

Monitoring and evaluation

- HERS assessments (Home Energy Rating Scheme - an Energy Efficiency and Conservation Authority project) on a range of Earthsong house types in 2008 gave them an 8 rating, the highest energy ratings in New Zealand to date (see appendix).
- Average energy use per household is around half of the national average (see appendix "Home Energy Comparison", 2003).
- Total water use per household is less than 2/3 that of a standard house, with almost half of this coming from tank water collected on site (see appendix "Home Water Use Comparison", 2003).
- Several joint-venture projects have been under way for some years with Waitakere City's water provider EcoWater. These include monthly monitoring of water meters in one unit to measure the water supply to each fitting in the house, water meters to other units to collate data on our dual tank water/city water system, the monthly testing of tank water quality, testing of pond water quality, and the installation of a composting toilet in the common house/Earthsong Centre to trial the use of composting toilets within the metropolitan drainage area. Detailed analysis of this data has yet to be done, but initial results confirm that half of the water used at Earthsong is

supplied by rainwater collected on site, despite all kitchen and bathroom cold taps being supplied only by council water (a council requirement), and a storage capacity of only 5,600 litres of water per house.

- An analysis of domestic refuse from Earthsong put out for council collection was undertaken in April 2003. The amount of waste per household for that one week averaged 2.2 kg, compared to a 9.6 kg mean obtained in a similar analysis of households citywide (see appendix “Rubbish Comparison”, 2003). Further education of residents regarding recycling has been ongoing since then.
- A comparison of land use area showed that while the house footprint at Earthsong was only slightly less than in the surrounding suburb, the total paved area for cars (parking, drives and roads) was less than half the surrounding area, and consequently the percentage of land area available for open space was almost 75% at Earthsong, and only 53% in the surrounding suburb (see appendix “Earthsong Landuse and Usual Landuse”, 2003).
- Achieved a Green Home Scheme “Excellent” rating from the Building Research Association of NZ for the terrace house design in 2001.
- A Post-Occupancy evaluation one year after the first 17 homes were completed showed a very high level of satisfaction with the design and performance of the houses.

Key indicators of success

Earthsong Eco-Neighbourhood is now a thriving community of diverse people. Residents include people of all ages, several ethnic groups, various backgrounds and a range of economic circumstances. The atmosphere is peaceful yet dynamic and engaged. The reality reflects the vision carried for so long, and this vision of cooperation with and respect for each other and the planet continues to unfold as attention is paid to ongoing systems.

Houses are warm, dry, and very comfortable to live in. Monitoring results show their thermal performance and water and energy efficiency is significantly better than for standard construction. The physical design of systems such as the passive solar houses and the overland stormwater system not only function to reduce the environmental impact, but also contribute to quality of life and a flourishing eco-system.

Despite major construction challenges and a very lengthy development process, the project is almost in a break-even financial position at the end. Running costs are significantly less than for a standard suburban house, and more facilities are available.

There is a continued and growing demand for site visits, tours, and presentations, as people are keen to visit to learn. There is continued interest from all sections of the media to showcase the neighbourhood as a viable and desirable alternative to standard suburban life.

Recognition

Awards

- Winner of the 2005 Auckland Regional Council Environment Awards in the category of Property Sector Urban Design.
- Finalist in the Year of the Built Environment Awards 2005 by the New Zealand Institute of Architects.
- EcoWise Community Award 2005 from Keep Waitakere Beautiful for best urban residential vegetable garden.

- “Dob-in-a-Do-Gooder” award December 2003 from Ranui Action Project and the Violence-Free Ranui Campaign for providing a positive example of cooperative living and ecological awareness (see appendix).

Books

- *Earthsong Eco-Neighbourhood* is featured as a case study in the book “A Deeper Shade of Green – Sustainable Urban Development, Building and Architecture in New Zealand” edited by Johann Bernhardt, Balasoglou Books, Auckland 2008 (attached).
- Chapter 10 on *Earthsong Eco-Neighbourhood* in “Sustainable Community – Learning from the Cohousing Model” by Graham Meltzer, Trafford, 2005 (attached).
- Featured in “Living in Utopia: New Zealand’s Intentional Communities” by Lucy Sargisson and Lyman Tower Sargent, Ashgate Publishing Ltd, 2004.
- Case study in “Creating our Future – Sustainable Development for New Zealand” by the NZ Parliamentary Commissioner for the Environment, 2002.

Media

Earthsong has featured in many journal, magazine and newspaper articles, radio and TV programmes over the years, a full list of which is attached in the appendices, along with copies of the following selected articles

- “A Place to Belong” by Alan Perrott, 30.8.08, Canvas magazine, NZ Herald.
- “Earthsong” by Hugh Patterson, August/September 2004, Progressive Building magazine
- “Good Neighbours”, November 03/January 04, EnergyWise News.
- “The Green Life” by Simon Collins, 24.11.01, NZ Herald.
- “Earthsong Eco-Neighbourhood – Groundbreaking” by John Pirtle, March 2001, EcoLiving New Zealand.

Academic papers

- Thesis for Master of Planning “Ecovillages, Planning and Sustainable Development in New Zealand” by Sarah Kernohan, November 2007, Otago University.
- Subject of Building Environment Simulation course for 4th year Bachelor Of Architecture students from Auckland University, 2006.
- Paper on “Is Policy Leading to Improved Sustainability at the Local Urban Scale?” by Dr Sumita Ghosh and Dr Robert Vale, for Built Environments, Landcare Research, Auckland, NZ, 2007.

Visitors

- Over 800 people visit every year, including one-off visits from such groups as local body politicians and bureaucrats from Western Bay of Plenty District Council and Christchurch City Council, senior Chinese government officials, graduate planning students from Dortmund University in Germany, Habitat for Humanity, NZ Association of Environmental Education Conference 2005, Year of Built Environment Open House 2005, BRANZ Eco Design Advisors tour 2006, and annual visits from groups such as Auckland Regional Council Sustainable Youth Leaders course, Bay of Plenty Polytechnic students, and Auckland University planning students.
- In 2003 the entire 300 staff of Waitakere City Council came through for official site visits as part of their upskilling and updating their commitment to being an Eco City.

Transfer

Locally

- *Earthsong Eco-Neighbourhood* is itself an adaptation of the cohousing model, originating in Denmark and increasingly adopted throughout the USA. We are the only cohousing neighbourhood in New Zealand to date, although several individuals and groups have sought assistance and advice from us in starting similar cohousing communities elsewhere in New Zealand.
- It is our intention to maximise the learning that can be gained from this development by sharing our knowledge and experience, and actively demonstrating both the design and technologies and the social processes to the public.
- We maintain a comprehensive website www.earthsong.org.nz (currently under reconstruction) and make our research and information freely available to others. We welcome tours of interested groups and have shown thousands of people through our neighbourhood.
- Earthsong is the subject of regular lectures given to architecture and planning students, and talks to many community groups. We have also introduced our consensus decision-making method to many other groups and organisations, and find it a powerful tool for empowering a diverse group to participate equally and to make decisions effectively.
- The *Earthsong Centre Trust* is developing a programme of conferences, meetings, workshops and seminars on a wide range of sustainability issues for community groups, businesses, students, local bodies and government departments, and for art, music and literature events. The Earthsong Centre is also available to local community groups for meetings and events. Located in the heart of *Earthsong Eco-Neighbourhood*, it provides a unique venue that embodies the principles of environmental, social and economic sustainability.
- Waitakere City Council adopted an “Eco-City” policy 10 years ago, and is drawing on Earthsong’s practical experience to help develop future neighbourhoods that demonstrate low environmental impact, are affordable, where people enjoy living and which have a sense of community. The council website links to Earthsong. See: <http://www.waitakere.govt.nz/abtctit/ec/bldsus/index.asp>
- *Earthsong Eco-Neighbourhood* has become a catalyst in the rejuvenation of the wider neighbourhood of Ranui. We have always intended that the front portion of our site will be developed as eco-friendly businesses which will link the housing with the wider neighbourhood, enhance the adjacent commercial centre, and provide work opportunities for both Earthsong residents and the wider community. We have set up another company, Walk-to-Work Eco-Developments Ltd, to develop this part of the property.
- Representatives of Walk to Work have been key members of the Ranui Central Development Network, a unique consortium consisting of Waitakere City Council, the Ranui Action Project, and the key landowners of the commercial centre of Ranui, and we are working together to develop a new model of town centre revitalisation and council consultation. The council has been quick to recognise the unique opportunity that is presented by having the key landowners, a strong community group, and themselves all willing to collaborate to develop a vibrant and eco-friendly town centre, and has brought forward several longer-term plans including a Town Centre planning process, to take advantage of the enthusiasm and goodwill that is present between parties who are normally in competition. We expect to develop processes and learnings that can then be applied to other small towns and communities. Walk to Work will be fully involved in the transformation of Ranui into a vibrant suburban community and commercial centre that reflects the cultural, social, and economic needs of the local community, and is a model of a socially and environmentally sustainable town centre.

Nationally

- Many housing organisations of different types have visited Earthsong to learn from us and gather ideas and inspiration for their own projects. These include Maori groups wishing to provide housing on their local marae (family village), a Housing New Zealand sustainability project developing eco-housing models for low income families, a Lesbian Elders Village project, and various government departments involved in research projects to develop more sustainable housing.
- Earthsong is a demonstration project for sustainable urban design principles for the Ministry for the Environment Tool for Urban Sustainability Code of Practice (TUSC). This project is developing a national code of practise and web-based planning and design tool for cost-effective urban sustainability design for new developments and urban retrofit or intensification projects.
- Case study on Ministry for the Environment website on Smart Growth July 2003.
- Case study in the Standards New Zealand Handbook SNZ HB 44:2001 “Subdivision for People and the Environment”.

Main barriers to further transfer

The financial costs and risks are high with any major construction project, and particularly when pioneering non-standard design and construction methods. There are further financial impediments to cooperative ventures, and very clear leadership, group commitment, and legal agreements between group members are needed.

Existing systems such as planning rules or legal systems may unnecessarily hinder cooperative developments. Decisions have to be made about when to try to change the system and when to work within the existing systems, as the effort of trying to achieve 100% success may mean that the project fails to materialise at all.

It requires significant time, skills and determination to build and maintain a cooperative village. A small group of 2 or 3 people need to make it their highest priority for as long as it takes, to the detriment often of their personal lives, although this can be easier for later projects that build on the experience of the pioneers such as Earthsong. However, specific aspects of the project, including group processes, communication skills, participatory design and decision-making, can be incorporated into a wide range of other contexts.

Conclusion

The cohousing model combines the individual privacy and autonomy that is cherished by most New Zealanders with the satisfactions of cooperation, safety and belonging that enrich our lives enormously.

“The value of the cohousing model in respect of social and environmental sustainability is its recognition of, and attempt to address, some of the failings of the late twentieth century society...; the breakdown of community, alienation of the individual, and the neglect of disadvantaged groups such as single parents, the elderly and the young. It does so via the hardware of site layout, building design and shared resources as well as, and perhaps more importantly, the software of participatory process, shared decision-making and a rich social agenda.”

Sustainability requires us to look beyond ourselves as discreet and independent lives and acknowledge our interdependence with each other and with the other life forms on earth. Knowing and cooperating with your neighbours builds connections that facilitate a greater sense of responsibility to each other, and ultimately to the global community. An awareness of and concern for other people and the natural environment is a key element in learning to live more sustainably.

We consider both the social and environmental aspects of this project as essential for the long-term health and sustainability of both ourselves and the planet as a whole. While the lifestyle may not appeal to all, this neighbourhood offers an option that is significantly different than is otherwise available in New Zealand. The balance of individual privacy and autonomy with increased access and commitment to community, combined with the application of the principles of green architecture and services, are a significant demonstration of a healthier living environment.



Referees

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TV Programmes and Videos Featuring Earthsong

- Subject of “A Climate to Change”, entry by Pakuranga College in the BIG Science Adventures DVD competition, 2007.
- Featured in a programme for Maori TV “Kiwi Maara” in 2006.
- Featured in “Changing the Future”, the third part of the 3-part TV documentary “The Middle Earth Connection”, made in 2004 by David Jacobs for Connected Media Trust, with clips from Peter Jackson’s movies “The Lord of the Rings” as a frame of reference for environmental issues in New Zealand.
- Asia Down Under TV show 2008.
- “My House, My Castle” TV programme about people changing the way they live, 2004.
- “Some of my Best Friends are Greenies” TV documentary.
- Featured on Radio programme “Auckland Issues” special on “Days of Cheap Oil are over”, with David Steemson and Kevin Moore, 15.9.04.
- Radio documentary on Earthsong on Spectrum, 20.5.01 with David Steemson.
- Earthsong on National Radio 9.7.01
- Interview for City Talk with David Steemson on National Radio 15.9.97.

Articles

- December 2008 MindFood magazine article “Urban Nature” by Rosie Bosworth
- 30.8.08 Canvas, NZ Herald article “A Place to Belong” by Alan Perrott.
- 2008 NZ Life and Leisure magazine article “The Green Neighbourhood”, by Bette Flagler.
- Spring 2006 Article in Automobile Association Directions magazine “Homing Instincts” by Nicola Dewe.
- 2005 – 6 Article in The New Zealand Retirement Guide on “Cohousing – an alternative retirement option” about Earthsong.
- 9.12.04 article in NZ Herald “Waitakere Backs Eco Village” by Wayne Thompson
- August/September 2004 Article in Progressive Building magazine “Earthsong” by Hugh Patterson.
- 11.6.04 article in Western Leader “Eco Village Opens Its Doors” by Rani Timoti.
- March/April 2004 article in Landscape New Zealand “Swales at Earthsong” by Cathy Angell.
- February 2004 article in Next magazine “All Together Now” by Amanda Cropp.
- November 03/January 04 article in EnearyWise News “Good Neighbours”.
- 17.7.03 article in Western Leader “Eco-Neighbourhood Poised to move to Higher Level” by Rani Timoti.
- February 2003 article in “Your Home and Garden” magazine “Happy Families” by Anne Barker.

- March/April 2002 Article in Landscape New Zealand “From Dream to Reality” by Cathy Angell.
- 8.2.02 Article in New Zealand Environment “Sustainable Housing: The Earthsong Eco-Neighbourhood Development” by Matthew Ledbury and Leanne Frisbie.
- 2002 EcoLiving New Zealand magazine “What a Difference a year Makes... at Earthsong Eco-Neighbourhood”.
- 24.11.01 Article in NZ Herald “The Green Life” by Simon Collins.
- 2001 Article in EcoLiving New Zealand “Cohousing for Social Sustainability”.
- 2001 Article in EcoLiving magazine “First Homes Completed at Earthsong Eco-Neighbourhood” by Lynette Loffel.
- August 2001 Article in NZ Building News “An Old Fashioned Neighbourhood in a Modern Environment” by Ted Wilson.
- 5.6.01 Article in NZ Herald “Eco-Neighbourhood with Shared Values”.
- 16.5.01 Article in West Weekly “The Grass is Greener on the Eco-Neighbourhood Side”, by Ruth Taylor.
- Article in EcoLiving New Zealand “Earthsong Eco-Neighbourhood – The Ultimate in Urban Sustainable Living” by Peter Scott.
- 8.5.01 Article in Western Leader “Eco-friendly Neighbourhood Takes Shape” by Aroha Fleming.
- March 2001 Article in EcoLiving New Zealand “Earthsong Eco-Neighbourhood – Groundbreaking” by John Pirtle.
- December 2000 Article in EnergyWise News “At Home on the Earth”.
- 24.3.00 Article in NZ Herald “Pioneers Follow Eco-Dream West” by Anne Beston
- 29.9.99 Article in Waitakere Week “Cohousing Village a First for NZ” by Rachel Wike.
- 13.2.99 Article in NZ Herald “Vision to Love Thy Neighbour” by Dean Austen.
- March/April 1998 Article in Soil and Health magazine “An Old-Fashioned Neighbourhood for the 21st Century” by Cathy Sheehan and Geraldine Hughes.
- 7.2.98 Article in Western Leader “Cohousing Villages Provide Community”

