Facing

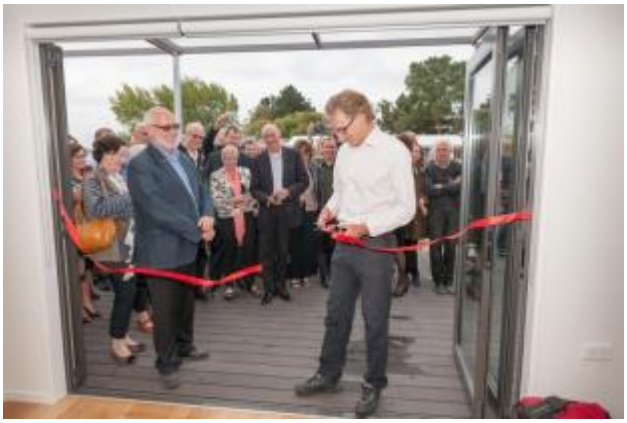
Newsletter of Beacon Pathway April 2013

In this issue

High Performance House now open

The High Performance House show home was opened on 12 March 2013 by CERA chief executive Roger Sutton who praised manufacturers for developing innovative solutions in response to housing need in Christchurch.

Mr Sutton suggested that off-site manufactured houses such as the High Performance House could fill a real gap in the Christchurch rebuild by reducing the amount of time homeowners needed to be out of their homes.



The house is now open to visitors Wednesday to Sunday from 12pm to 4pm at the HIVE Home Innovation Village, Curletts Rd, Christchurch.

What is the High Performance House?

The High Performance House brings together an innovative new building system, Warmframe™, with Salmond Architecture's High Performance Houses™ design and other sustainable technologies.

The house showcases the benefits of off-site construction (lower build costs and speed and quality of construction) and excellent performance (warm, healthy, energy and water efficient, low running costs).

Warmframe™ technology

Warmframe™ combines steel framing, insulation and double glazing into a single prefabricated wall unit. In combination, these products create a wall system significantly better insulated than Building Code minimums.

Built off-site in just ten weeks, Warmframe™ construction is ideal for Canterbury rebuilds. The faster build allows people to live in their old homes during construction. Other accommodation is only needed while he site is cleared and the house is delivered and assembled.

The High Performance House at HIVE is the first trial of the new system, which has been developed in collaboration between industry partners New Zealand Steel, Frametek-RFS, InsulPro, Fletcher Aluminium and Resene, and facilitated by Beacon Pathway. Consequently, the performance of the house and Warmframe™ will be tested and monitored.

The partners believe the benefits of Warmframe™ will be:

- Off-site construction - With Warmframe™, an entire wall - or even house - can be built in the factory. This has the potential to lower construction (and therefore purchase) costs because of the accuracy and reduced wastage possible in a factory, and because of the speed of offsite fabrication in a controlled and secure environment with no weather delays (no waiting for framing to dry out!). Ideal for Canterbury rebuilds, a faster build causes less disruption, allowing people to continue to live in their old homes throughout the construction period. Other accommodation will only be required whilst the site is cleared and the Warmframe™ house is delivered and assembled. The High Performance House at HIVE, for example, was completely built off-site in 10 weeks.
- High performing house – Warmframe™ provides a way to insulate steel framing to a very high standard of thermal performance. The resulting homes should be very warm, healthy and energy-efficient, with lower power bills.
- Flexibility of design – Warmframe™ can be applied to any house design – it is a building system, not a particular style of house.

Adaptable design

The house has been designed using the High Performance Houses™ adaptable building system. This uses combinations of pavilions and links with a range of options in cladding, roof type and fit-out available to customise each home.

Warm, healthy, low running costs

Packed with energy and water saving features, this highly insulated and well-designed home will lower running costs and provide warm, comfortable, healthy living.

The home has other high performing features which will add to its value and low running costs including: photovoltaics for energy generation, solar water heating, wood pellet burner and a rain water tank.

With quality fittings and specifications, the High Performance House will be good value for years to come.

For more information, visit

www.warmframe.co.nz

www.beaconpathway.co.nz/new-homes/article/what_is_the_High_Performance_House_at_HIVE

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Message from the CEO

Whew! I'm writing this after all the excitement of opening the new High Performance House at the HIVE Home Innovation Village.

It's been quite a journey – from the technical experts tinkering in a shed in the early stages of brainstorming a new product, to building this first house in another shed and trying to solve the many problems which occur (predictably) on the way.

Then of course it was a journey of another sort – a 20 minute middle of the night, back of a truck journey to move the house (fully built and painted) onto its site at HIVE. Now that was exciting, especially fitting under the motorway bridge!

Now the house is on site, finished and open to view. The response so far has been amazing. 500 people the first weekend after the opening, and another 500 this last weekend. There's a lot of interest in Christchurch in simple quick solutions and the rapid off-site build has sparked considerable questions.

Of course, as with most Beacon houses, the High Performance House is also a project. Our work doesn't finish with the constructed house. We're settling down now to analyse the build costs and to organise testing of the thermal performance of both house and Warmframe walls. From what we've seen so far, we're feeling confident that the steel frame / insulation / double glazing combo will provide excellent thermal performance. Just how warm the house will be is monitored via SPLASH – I've just had a peek now and it's 21°C inside and 14°C outside and that's without the pellet burner going.

The information we gather from the High Performance House will feed into our other projects which will use the Warmframe system. We've called the overall programme of work, the New Category of Home project, because we're aiming to challenge business-as-usual new builds with solutions that offer the benefits of both off-site construction and higher performance.

On another note, I've also just been at the Build Back Smarter workshop which brought together organisations with an interest in rolling out the Build Back Smarter approach across Christchurch. We had a great discussion, with people in the room from Ministry of Business innovation and Employment, EECA, Christchurch City and Waimakariri District Councils, Christchurch District Health Board, CERA, Cancern, IAG, Arrow, Fletcher Building, InsulPro and Community Energy Action.

It made me think about the great value of getting people from different perspectives into the same room to move progress forward. Sadly the scale of the problem in Canterbury hasn't changed but there is a real will to collaborate to find solutions. I was heartened by the willingness of different organisations to participate, both in the workshop and as part of the Canterbury Sustainable Homes Working Party.

Beacon's worked with partners extensively across all our projects – you only need to look at the many partners and suppliers who contributed to the HIVE High Performance House! We're used to working that way and we see enormous value in collaboration. It may take longer to get to the right outcome but we know the 'many heads' will make that outcome more robust in the long term.

So a big thank you to our partners and fellow collaborators – we couldn't do it without you!

Nick Collins

Build Back Smarter – the upgrade of Huntsbury 2

Huntsbury homeowners David and Helen are already noticing the benefits of having their house upgraded during their earthquake repairs. The retired couple had their walls, ceilings and floors insulated, a new heat transfer system and range hood and some double glazing as part of Beacon Pathway's Build Back Smarter project while their home was repaired.

Helen and David's four-bedroom hillside home was damaged during the February earthquakes with the movement of the outside concrete block walls and cosmetic damage inside.

Their Hawkins project manager suggested including their home in Beacon Pathway's Build Back Smarter project and it is the first house in the trial to be completed.

"We have really noticed a difference in the warmth of our home and it's also a lot cooler on those really hot days we've been having," said Helen.

The couple, who are former English as second language teachers, used to heat their dining room/main living area with a woodburner and spend as much time as possible in this area. The rest of the house, particularly upstairs, would remain cold, even on sunny days.

"I used to put on a down jacket to go into the lounge to play my piano. Our home is now so much more comfortable and we've even noticed health benefits such as fewer sinus issues. We are very appreciative of the work that has been done and how it will impact on our lives."

David and Helen's home was upgraded late last year at the same time as earthquake repairs were carried out, with Beacon Pathway's Bill King as project manager. Although they had to move out, David and Helen were pleased with how easy the process was and that the additional upgrades did not delay their repairs.

"We are very grateful that the work was completed so early and we hope the other people in the trial enjoy their warmer more comfortable homes."

Helen and David with project manager Bill King

Watch a video on Huntsbury 2 at:
https://www.youtube.com/watch?v=KW9M3cfEryE

The Build Back Smarter project

Build Back Smarter is a 10 home project which aims to show that performance upgrades (to make homes warmer, healthier and cheaper to run) **can** and **should** be included with earthquake repairs to Canterbury homes.

Beacon wants to find out whether performance improvements can be undertaken without slowing down the rebuild process. The project is funded by the Energy Efficiency and Conservation Authority, Fletcher Building, Christchurch City Council, Christchurch Agency for Energy and the Ministry for Science and Innovation.

The extensive repair and rebuilding required in Christchurch presents an opportunity to include upgrades which will improve home performance – Beacon Pathway calls this building back smarter. Typically, performance upgrades might include high levels of ceiling, floor and wall insulation, clean heating, solar or heat pump hot water, and rain tanks.

Earthquake damage to Huntsbury 2

David and Helen's home (called Huntsbury 2 in the project) is a large 1960's concrete block and stucco house with a first floor extension built in the 1970s and a basement garage.

Huntsbury 2 had some typical earthquake repairs which gave Build Back Smarter the opportunity to include extensive insulation. Internal ceiling linings needed to be extensively replaced, allowing current ceiling insulation to be topped up. The stucco veneer and some wall linings were due to be replaced – this is an ideal time to install wall insulation. As often happens, cracking of interior linings turned out to be so extensive that most linings were removed, and most external walls, upstairs and downstairs, were able to be insulated.

While David and Helen were out of the house and repairs were underway, Build Back Smarter also made some extra changes to make sure the home was warmer (double glazing, draught stopping and heat transfer), drier (better ventilation and a vapour barrier) and more energy efficient (hot water pipe lagging).

The upgrades

A house assessment established a plan for upgrades which was finalised in discussion with Helen and David. The final upgrades included:

- Topping up ceiling insulation, and installing underfloor and wall insulation, to above Code minimums
- Installing an underfloor vapour barrier
- Double glazing south facing windows in the upstairs bedrooms
- Draught stopping doors
- Lagging hot water pipes
- Installing a range hood vented outside
- Installing a heat transfer kit and thermostat from the living area to the upstairs bedrooms

Read the full Huntsbury 2 case study here:

www.beaconpathway.co.nz/existing-homes/article/huntsbury_2

Lessons from Build Back Smarter

The completed Build Back Smarter upgrade of the Huntsbury 2 house – and other related activities - have already provided findings which will help support rolling out the upgrade approach on a wider scale.

1. **Opportunities for wall insulation can be greater than scoped.**

Opportunities for wall insulation retrofit can be greater than initially scoped as the builder is likely to employ the quickest and most practical methods – which often will involve relining rather than repairing plasterboard

Additional wall insulation opportunities arose during the Huntsbury 2 construction period when the builder decided to replace most wall linings

2. **Build Back Smarter upgrades were easily incorporated into the repair process**

The experience of the Huntsbury 2 case study was that there was sufficient down-time within the contractor's normal schedule that the wall insulation installation was easily accommodated. However, it should be noted that a prompt response from the insulation installation company was required, and this was a change from their business model and approach of booking well ahead for ceiling and underfloor installations.

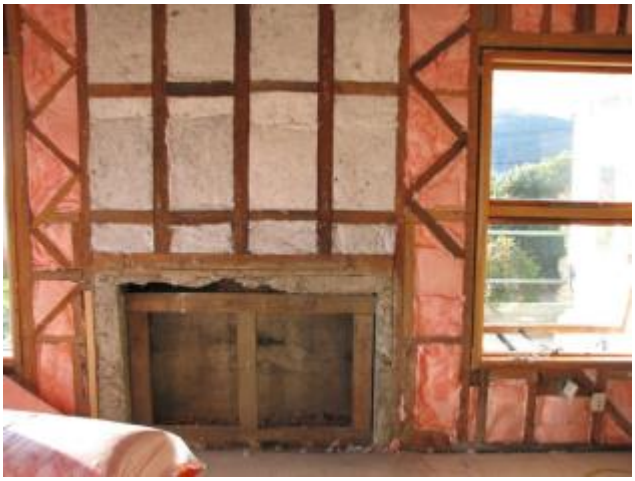
3. **Building consent requirements were not an issue**

The two methods used to install wall insulation in Huntsbury 2 both complied with the DBH guidance, and so no Building Consent was required by Christchurch City Council. The two methods were:

- Installing segment wall insulation where building wrap was put in place as part of the recladding work undertaken
- Stapling building wrap into the wall cavities (as outlined in NZS 4240:2006) and installing segment insulation where the internal linings only were being replaced.

Both of these wall insulation methods could be regarded as standard industry practice (although stapling building wrap into the cavities is a time consuming and expensive process), and were easily accommodated into the build schedule.

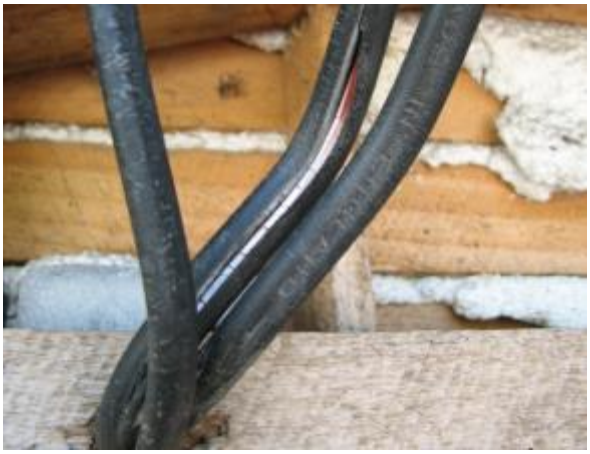
Since the Huntsbury 2 repair was completed, further guidance on retrofitting wall insulation as part of earthquake repairs has been issued by MBIE and EECA. This identifies how and when wall insulation is able to be installed without the requirement for building wrap inserts to be stapled into the cavities.



4. **Degraded wiring can be addressed through good practice**

When the repair work commenced in Huntsbury 2, the builder identified that there was degraded wiring in the house, and sought the advice of an electrician. He recommended to the homeowners the replacement of some of the wiring, to make the house safe (irrespective of the wall insulation issue) and the homeowners spent $1000 getting this work done.

Registered electricians are well aware of the potential issues with TRS wiring and as the volume of insurance repair work increases, builders will become more aware of these issues also. PMOs have provided specific training for their staff on recognising and assessing potential risk with TRS wiring. Most over-cap insurance repairs have the power supply to the house disconnected at the start of the repair and that this stage the electrician involved would usually assess the condition of the electrical supply by inspecting the distribution board. This would identify the presence of TRS wiring.



Well done, EQC!

We are delighted to see the Earthquake Commission's announcement (4 March) that they would be giving homeowners the opportunity to install insulation in areas exposed during earthquake repairs.

www.eqc.govt.nz/news/repairs-accommodate-insulation

Congratulations should also go to EECA and MBIE for their work in bringing about the change in policy and for the recent guidelines to retrofitting wall insulation.

Rolling BBS out to more homes

Recently the Build Back Smarter team held a workshop to bring stakeholder organisations up to date. The team presented a review of progress and the interim findings of the project so far, followed by a workshop discussion on how Build Back Smarter could be rolled out across Canterbury.

The workshop attracted an eclectic mix of people representing industry, local and central government, community organisations, PMOs and insurers.

Discussions reflected a general agreement that there was both a need and enough information for the BBS findings to be turned into a roll-out plan. The range of viewpoints expressed made a useful starting point for ideas on next steps – Beacon will now be working with partners to develop a process that can be rolled out alongside wider earthquake repairs.

One key point from the discussions was that Build Back Smarter focuses on major, insurance funded repairs, which are a subset only of damaged homes across Canterbury. Information and communication of the Build Back Smnarter opportunity needs to be targeted through insurance companies, rather than to the general populace.

Reducing waste - Havelock North Best Homes™

The recently built Havelock North Best Home™, built by Horvath Homes for Hastings District Council, not only produced relatively little construction waste, it sent staggeringly little waste to landfill.

How did they do it?

Horvath Homes focused on both reducing the amount of waste produced and diverting as much waste as possible from landfill. They had economics in mind; the cost of skip hire and landfill disposal of construction waste is substantial.

The construction manager, Hugh Campbell, was in charge of minimising waste. He prepared a short waste management plan (less than 1 page) before construction commenced. This identified the major sources of construction waste and where they could be recycled. He also briefed all subcontractors on waste requirements.

A key difference in the management of construction waste for the Best Home building site was the absence of a skip for wastes to landfill. In fact the only bin on site was for timber; all other wastes were piled up and removed quickly when produced. This meant that the site remained tidy, and the temptation to stick recyclables in the bin destined for landfill was eliminated.

Off-cuts and other construction waste were sorted and weighed on site. Where possible, materials were re-used or recycled, and only the remaining materials were sent to the landfill.

Many suppliers took responsibility for the wastes generated by their materials. For example:

- Timber off-cuts were taken back by PlaceMakers, reused, or used as fuel in the nearby Whirinaki Power Station
- Paint containers were taken back by the supplier for recycling.
- Plumbing and drainage offcuts were taken by the supplier.
- Polystyrene offcuts from the cladding were taken back by the supplier who returned them to the manufacturer for recycling.

Local recycling companies recycled cardboard, concrete, Linea weatherboards, plasterboard offcuts and plastics. In addition Horvath Homes reused some offcuts (e.g. building wrap, polythene sheeting) on other houses under construction.

The results

The Havelock North Best Home™ has a total floor area of 186.68m2. In total, 15.15kg/m2 of floor area (2829.15kg) of waste was generated from the house's construction. Of this, 95% (2696.15kg) of waste materials was diverted from landfill.

It is interesting to compare this to standard build houses, in this case a study by Christchurch City Council of the construction waste produced in "normal" homes being built around the city (pre-earthquakes).

Builder	Waste by floor area (kg/m^2)	Waste diverted from landfill	Waste (kg/m^2) to landfill	Waste management method
GJ Gardner	17	70%	5	All waste in skips (2.5 x 7.5m^3 skips used)
Jennian Homes	18	75.5%	5	All waste in skips (4 x 7.5m^3 skips used)
Mike Greer Homes	22	54%	10	All waste in skips (4.5 x 7.5m^3 skips used)
Orange Homes	23	60%	9	All waste in skips (3 x 7.5m^3 skips used)
Stonewood Homes	21	80%	4	All waste in skips (3 x 9m^3 skips used)
David Reid Homes	19	84%	3	All waste in skips (4 x 7m^3 skips used)
Benchmark Homes	25	82%	4	All waste in skips (43 x 7.5m^3 skips & 2 x 3m^3 skips used)
Golden Homes (Steel framed)	12	76%	3	All waste in skips (2 x 7m^3 skips used)
Best Home	15	95%	0.7	Sorted on site with bin only for timber

How did Horvath Homes get such a good result?

A critical factor in Horvath Home's success was the strong commitment of the construction manager – and all the tradespeople working on the site – to sorting waste as it was generated, and making use of every possible recycling option. Clear briefings on the waste management objectives, the frequent on-site presence of the site manager, and good project management explain why the waste management practices were so good.

Equally important was the absence of a general waste bin on the site. Waste to be sent to landfill had to be consciously sorted into a pile. This is a totally different approach to the normal waste management on a construction site where the large landfill skip is provided, making it easy – and tempting – to dispose of waste to landfill.

The availability of recycling options for plasterboard, concrete waste and timber were critical to achieving such a good result – these three wastes represented nearly 79% of the total waste generation. Also impressive was the product stewardship approach of material suppliers which made a big contribution in terms of weight of waste recycled.

When the types of waste are analysed, two further points stand out. One is the absence of hazardous waste in the Havelock North Best Home™, a positive result of careful selection of low VOC and non-toxic materials and products.

The second is that errors and rework generate substantial extra waste, even in this well-project managed house. Over 58% of the waste produced was concrete/masonry. This reflected the complete rework of a concrete thermal wall in the Best Home, creating an extra 900kg waste (31.8% of total waste generated).

North American medium density study tour – be quick, nearly closed!

Beacon is leading a 2013 study tour to investigate successful medium density developments in North America.

The tour, which is proposed for the second half of May 2013, will take in Vancouver, Victoria BC, Seattle and Portland. These cities showcase successful and sustainable medium density developments, which have led to changes in market demand.

New Zealand faces the challenge of delivering more affordable and better housing solutions to meet demand. Medium density development is part of the solution, but only if it is done well and is appealing to the community.

The goal is to experience successful and more sustainable medium density housing and neighbourhoods in both suburban and inner city settings.

The tour includes the Living Future conference and trade show in Seattle May 15 - 17. The seventh annual conference of the International Living Future Institute, Living Future 2013 is the forum for leading minds in the green building movement. This year's educational program theme is "Resilience & Regeneration".

Download the latest itinerary here

www.beaconpathway.co.nz/index.php/news/article/north_american_study_tour_to_focus_on_medium_density

The tour is filling up fast and we now have 10 people confirmed on the tour from central and local government, design and construction companies, and environmental consultancies as well as architects, property managers and developers.

Expressions of interest close **12 April**, contact Libby Elmore libbye@beaconpathway.co.nz

Nick Collins on Radio NZ's Nine to Noon

Should households routinely collect and store rainwater?

Nick Collins was interviewed recently on residential rainwater harvesting, making the following points.

Drought has highlighted the shortage of urban water in most parts of New Zealand. In areas where water is charged for, there is a financial incentive to store and reuse rainwater. Research shows household demand can be reduced by around 50% with the installation of a rain water tank, dual flush toilets and low flow showers. And the payback is good - most rainwater interventions will pay for themselves in two to five years.

Councils need to ask why high quality treated water should be used for low quality needs. Grey water could be used for gardens and toilet flushing, and much of rural New Zealand survives off rainwater already. A variety of systems could be used in conjunction with big centralised water networks. Kapiti Coast District Council, for example, was 'quite clever' in providing alternatives to meet water requirements in the district plan by providing alternatives. The Kapiti Council approved a Watersmart device which diverts all household greywater for irrigation for use in Kapiti.

While some councils strongly advocate for water tanks, others see it as a barrier. Kapiti Coast District Council, for example, mandates greywater reuse together with water collection / reuse; Christchurch City Council actively discourages greywater; and Auckland Council charges for discharge based on 80% of reticulated water volumes. A directive from central government could make it easier for councils to introduce policies.

Listen to the full interview here

http://www.radionz.co.nz/national/programmes/ninetonoon/20130321

Inspiring Communities

A PROVOCATIVE BREAKFAST CONVERSATION

Community-led Development: Passion and Courage.

MCed by Rod Oram with conversation from:

- Ngati Whatua: An iwi perspective
- Linda Biggs: Inspirational local leader; Manager, Manurewa Parenting Hub.
- Jim Diers: Activist and advocate for neighbour power; former Director of Department of Neighborhoods, Seattle; now working globally.

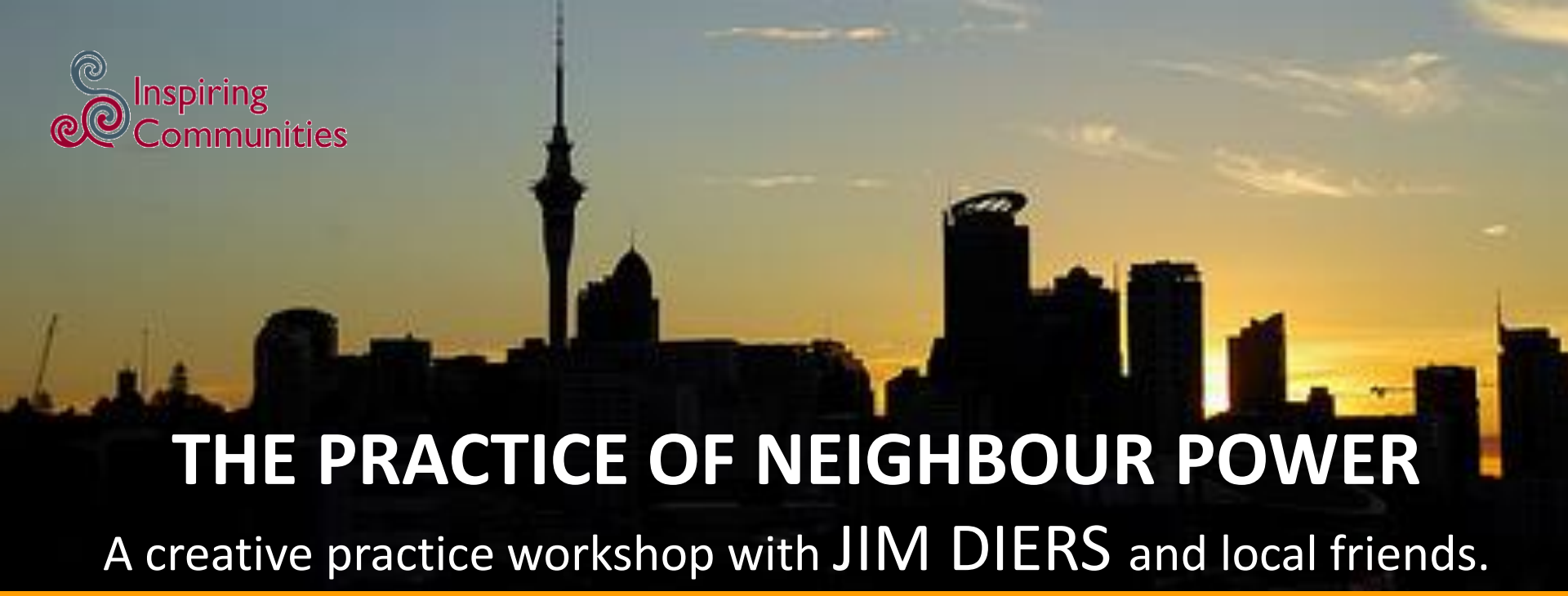
WESLEY COMMUNITY CENTRE

17 APRIL 2013, 7.30-930am

Cost: $30 per person including breakfast.

Rsvp to mandy@communitywaitakere.org.nz by 10 April. *Limited places.*

No Eftpos! Please bring cash or cheque on the day thankyou!



Inspiring Communities

THE PRACTICE OF NEIGHBOUR POWER

A creative practice workshop with JIM DIERS and local friends.

Working together with communities, connecting people in places, contributing to improved community wellbeing.

- Why neighbourhoods matter and what they can do
- How to mobilise and work alongside communities
- Work on real life examples from your own communities

WESLEY COMMUNITY CENTRE

17 APRIL 2013, 10-3PM

Cost: $125 per person, $300 for 3 people, $900 for 10 people including lunch.

Rsvp to mandy@communitywaitakere.org.nz by 10 April. *Limited places.*

No Eftpos! Please bring cash or cheque on the day thankyou!