SUSTAINABILITY IN APARTMENT DESIGN &

CONSTRUCTION METHODOLOGY

FOR

THE CONRAD GROUP OF COMPANIES

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WHAT WE BELIEVE IN

As far as Conrad Properties and its associated entities are concerned, sustainability involves the simultaneous pursuit of further development of our employees, contractors and subcontractors, profitable economic growth and good corporate citizenship. Underlying these values are the sustainable use of natural resources and sustainability in our designs for the ongoing users of our products.

HOW WE ACHIEVE THIS

People

- By offering our employees, contractors and subcontractors good opportunities for development and an attractive working climate
- By making all contributors accountable for their waste
- By making an ongoing effort to improve the health and safety of both our employees and customers

Planet

- By using energy and raw materials efficiently and reducing the environmental impact of our activities
- By improving the eco-efficiency of our products (developments) and processes on an ongoing basis
- By reducing waste at the source

Profit

- By showing a solid financial performance, not just in the short term but in the long term
- By selecting contractors and subcontractors that offer innovative sustainable solutions to the benefit of all employees and customers

1.0 INTRODUCTION

Conrad Properties and associated entities has implemented a five year plan to become not only sustainability aware but a leader in the field of sustainable design for both our residential and commercial projects.

To achieve this we have broken Environmentally Sustainable Design (ESD)'s into two basic categories. Firstly our commitment to the design of the projects in terms of project orientation, solar gain and loss, natural ventilation and long term energy efficiency for not only today's but tomorrow's users of our products. Secondly our commitment to the construction of the projects in terms of consultant, contractor, subcontractor and suppliers selection. We intend to implement an ESD initiative form that outlines our goals and intentions and must be completed by all consultants, contractors, subcontracts and suppliers prior to their being accepted on our projects.

Conrad Properties and associated entities has recently become a member of the New Zealand Green Building Council.

Conrad Properties and associated entities are investigating our carbon footprint and how we can become carbon neutral over the next 5 years. Our plan is to implement this in stages being year 1 consultants and sales divisions, year 3 Contractors, year 3 Subcontractors years 4 and 5 material suppliers.

2.0 BASIC GUIDELINES FOR ENVIRONMENTALLY SUSTAINABLE DESIGN

Design

- Appearance and layout able to withstand the test of time
- Flexibility to adapt to your changing needs
- Healthy to live in
- Considering local climate and environmental factors
- Minimal visual and physical impact on the environment
- Passive heating, cooling, ventilation and waste management
- Energy efficiency and production

Construction materials

- Natural products, with low or zero toxicity
- Locally produced, with low embodied energy
- Re-used, recycled and/or renewable
- Durable, low maintenance
- Future-proofing and environmentally friendly technology

Construction practices

- On-site recycling of waste materials where possible
- On-site sorting of all other waste for recycling
- Erosion, sediment and emissions control
- Protection of surrounding ecosystems – flora and fauna

Operational features

- Passive solar heating
- Self-cooling and ventilating
- On-site rainwater harvesting and use
- On-site treatment/disposal of water, sewage and other waste (where possible)

3.0 SUSTAINABLE DESIGN METHODOLOGY

3.1 Change of Use

First principle of project analysis being to avoid deconstruction. Adaptability and change of use being the primary considerations where a project requires demolition of a large existing building. It is recognized however this is not easy because applying existing rules of planning and building codes to older structures can become very uneconomic.

3.2 Indoor Quality

Ventilation and internal air pollution

- Natural ventilation is achieved with cross apartment ventilation
- Bathroom extract to expel bathroom air pollution
- Sealed rubbish bins to be kept inside cupboard space
- Fresh air to bedrooms (switched)

Daylight

- Natural daylight to all habitable spaces
- All apartments face east, north or west and all get good natural daylight during the day

Glare Control

- Minimal window sizes to direct north
- Fins to east and west elevations
- Balconies from above providing sunshade
- Opaque glass to external balcony balustrades

Outlook

- Primary outlook north, east and west with a minimum 30 metres unless over a street or lane

Thermal comfort

- North facing concrete wall to gather heat during the day and disperse to the units behind it at night
- Fins to east and west elevations
- Concrete floors to gather heat during the day and disperse to the units at night

Individual comfort control

- Individual heating is suggested via task heating

Internal noise levels

- To meet NZBC or other local authority requirements – achieved by heavy duty aluminium windows and doors to provide air seal to apartments
- Inter-tenancy walls and concrete floors to be STC55 and ICC55 respectively.

3.3 Outdoor Quality

Sensored lighting

- All external lights to access ways to be on motion sensors per level

Carbon monoxide

- Carbon monoxide monitoring in basement car parks with extractor to be powered on if level become too high

Lift

- Kone (Monospace) the supplier claims this lift is the world most power efficient lift available on the market

Swimming pool

- Pool cover to be used to stop heat loss

Landscaping amenity

- Landscaping to be provided for amenity where possible

3.4 Energy Efficient Operational Design

Ventilation

- Natural ventilation is achieved by cross apartment ventilation. This is achieved by opening windows to rear bedroom and opening windows and doors to balconies at the front of the apartments
- Fresh air to bedrooms (switched)
- Opening windows to all bedrooms

Hot water/ Cold water

- Central hot water plant (gas fired) to handle peak flow demand
- Cold water tap flow restrictors to 15L/minute
- Hot and cold water flow restrictors on shower heads

Refrigeration

- Energy-efficient electrical products with an energy star label
- Fridge space designed for single door fridge/ freezers only

Cooking

- Electrical 2 burner ceramic tops

Lighting

- High efficiently long life bulbs where possible (under management contract) with the benefits being energy efficiently and radiating more natural light

Laundering

- Front loading washing machine (Use less water)
- Energy-efficient electrical products with an energy star label

Transport

- Less car parking than accommodation provided forcing the use of public transport

4.0 OPERATIONAL METHODOLOGY (END USER INFORMATION)

4.1 Operational Use

During the life of the apartments for both owners and occupiers to manage and reduce their individual impact on the environment and climate change we intend to introduce a new section to the owner's manual that is in each apartment at handover. General tips for energy-efficient homes (extracted from www.carbonzero.co.nz) are ideas that are suggested for ongoing sustainable living.

Energy Efficient Home Heating

- Damp homes take more energy to heat. Reduce condensation by leaving curtains, windows and doors open on fine days when you are at home. Dry air is easier to heat, and healthier
- Use thermostats and timers on heaters
- Use door snakes (draught stoppers) to reduce draughts
- Close curtains before dark to keep heat in
- Use heaters away from windows – they are more effective against walls
- Use an extra blanket or hot-water bottle instead of an electric blanket
- Put on a jersey instead of a heater
- Check the air tightness of windows, floors and doors
- Use a ceiling fan to distribute heat in winter and cool air in summer
- Install thermal-lined curtains with pelmets and save $60 per year

Energy Efficient Appliances

- Domestic appliances are responsible for 15% of home electricity
- Choose energy-efficient electrical products with an energy star label on them
- Many appliances use up to 40% of their annual energy consumption on standby and not doing anything

Kitchen Appliances

- Choose fridges and washing machines to suit your household size
- Refrigeration is responsible for up to 10% of total energy
- Position the fridge away from the stove or direct sunlight
- Set fridge to between -2C and -5C, and freezer to -18C
- Use the microwave in place of the oven or stovetop. Microwaves use 70% less electricity
- Make sure your dishwasher is both energy and water efficient. Only do a load when the machine is full and use the economy cycle. Use the dishwasher to heat its own water as it is cheaper than using cylinder water

Laundry Appliances

- Wash clothes in cold water and only when the machine is full
- Instead of using your dryer, dry clothes inside using the power of the sun
- Make sure clothes are well spun before putting them in the dryer
- Use low heat settings on the dryer whenever you can
- Make sure the dryer is well vented outside
- Clean the lint filter after each use

Bathroom Appliances

- Turn off heated towel rails in summer months and when not using them
- Shower with windows open or vent the room to avoid moisture build-up

Other Appliances

- Turn off appliances either at the on/off button or at the wall when not in use
- For entertainment appliances (e.g. TV, video,) turn off at the on/off button. For other appliances such as washing machines, driers, microwaves, phone chargers, turn off at the wall and save 5% on your power bill
- Turn your computer monitor off when not in use as it uses over half the total energy needed to run a computer (the screen saver does not save power)
- Turn the hard drive off when going out or overnight
- When going away for holidays, turn off all non-essential appliances at the wall

Energy-efficient lighting

- Ten percent of domestic electricity is used in lighting
- Switch off lights when they are not needed
- Paint walls a light colour – dark walls need more power for the same amount of light
- Where you can, use natural daylight instead of turning on the lights
- When incandescent light bulbs blow, fit lower-wattage bulbs, or compact fluorescents, instead. Changing five frequently used bulbs with compact fluorescents saves 5% on your energy bill. A fluorescent bulb has a longer lifetime and uses 75% less electricity to produce the same amount of light as an equivalent incandescent bulb – a saving of $10 per year in electricity and 250 kg CO2

Energy Efficient Transport

- Walk, cycle or use public transport instead of the car
- Buy a fuel-efficient, low-polluting car. A smaller car is much more efficient
- Get your car serviced regularly
- Drive smoothly and steadily
- Use your air conditioning unit sparingly

Waste Reduction

- Recycle paper, cardboard, aluminium and steel cans, plastic, glass bottles, milk containers and toner cartridges
- Buy recycled products
- Select products with minimal packaging
- Take your own bags to the supermarket
- Buy economy size so you use fewer containers
- Buy only what you need
- Buy local in-season produce as much as possible
- Don't waste food

5.0 SUSTAINABLE CONSTRUCTION METHODOLOGY

Sustainable construction principals and methodology to be implemented by the main contractor and subcontractor's on and offsite.

Project Planning

- Identification and communication of responsibilities
- Gained input from personnel involved
- Provided education and information to relevant stakeholders
- Developed (and analysised) waste management program
- Integration of cost-control, reporting and monitoring
- Arrangements for material separation and collection

Pre-Construction

- Incorporates use of modular components
- Designed to standard material sizes
- Designed for operational waste minimization

Design

- Incorporates use of modular components
- Designed to standard material sizes
- Designed for operational waste minimisation

Purchasing

- Avoid over-estimating and rounding-up of purchasing requirements
- Specify exact requirements to suppliers
- Buy environmentally improved & recycled content products
- Specify exact requirements to suppliers

Off-Site Activities

- Incorporate the use of prefabricated materials

On-Site Activities

- Materials stored to avoid degradation/damage
- Minimization of incoming packaging materials
- Separation and recycling of materials (incl. Packaging)
- Litter management principals implemented on site
- Plan for safe disposal of unavoidable waste

6.0 CONSTRUCTION WASTE MINIMISATION STRATEGY

Construction waste minimization strategy to be implemented by the main contractor and subcontractor's on and offsite.

Innovative Practices to Eliminate or Minimise Waste

- Implementing a fully integrated waste minimisation plan
- Procurement/purchasing policies that support waste avoidance
- Building to standard sizes
- Building for operational waste minimisation
- Contract specification for sub-contractors that require implementation of waste minimisation practices
- Staff induction that promotes waste minimisation
- Monitoring/review process to evaluate and modify waste minimisation practices
- Data gathering process to monitor materials recovered, recycled and land filled.

Promotion & Use of Recycled & Recyclable Materials

- Procurement & purchasing policies that encourage use of recyclable or recycled materials.
- Practices & contract specifications that support material salvage & re-use where appropriate
- Contract specifications for subcontractors that support re-use & procurement/purchase of recycled or recyclable materials where appropriate.
- Promotion of waste minimisation achievements

Recycling of Materials Generated

- Seperation of discarded material on site for collection & recycling
- Collection of unsorted discarded material for recycling
- Recycling on site

Safe Disposal of Unavoidable Waste

- Safe disposal of unavoidable waste

7.0 REFERENCES

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