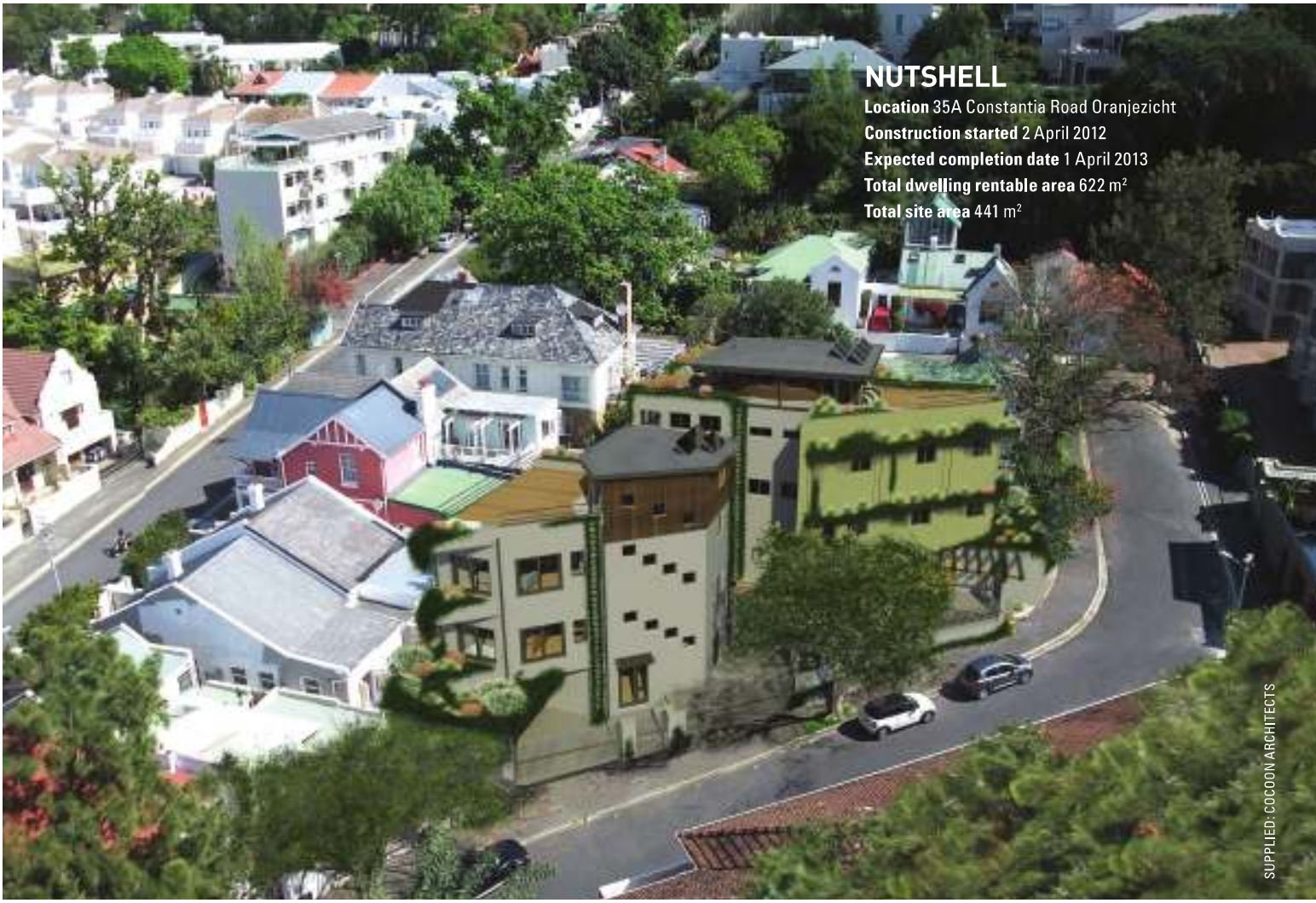
SUPPLIED: COCOON ARCHITECTS

A TALE OF TWO BUILDS

Despite the very different stories behind CoCoon Eco Lofts and 40-on-Oak, both testify that sustainability is starting to come into its own in multi-unit residential developments.

WORDS RAINE ST. CLAIRE



NUTSHELL
Location 35A Constantia Road Oranjezicht
Construction started 2 April 2012
Expected completion date 1 April 2013
Total dwelling rentable area 622 m²
Total site area 441 m²

SUPPLIED: COCOON ARCHITECTS

COCOON ECO LOFTS: THE QUINTESSENTIAL PILOT PROJECT

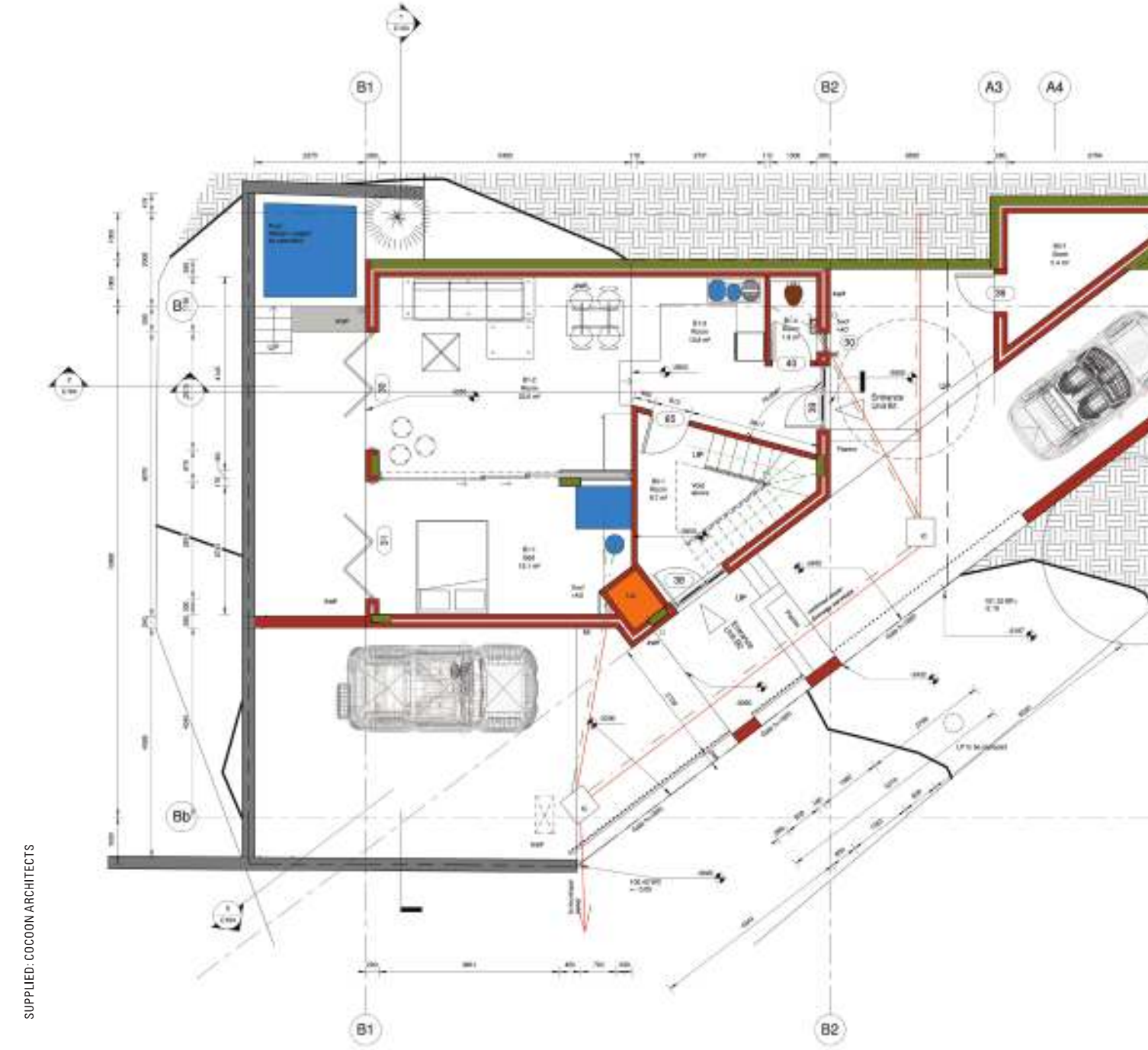
In 2005, Dennis Spaeth conceived Eco Lofts, a sustainable multi-unit residential project that predated the establishment of the Green Building Council of South Africa and the launch of its Green Star rating tools. Spaeth was ahead of his time and like many pioneers struggled to get the necessary backing.

FINANCE VS UNMOVEABLE PRINCIPLES

Various developers were indifferent towards Spaeth's uncompromising sustainability principles and negotiations with an empathetic buyer ultimately failed. This was alongside the financial crisis, difficult to secure bank financing at acceptable rates and a drop in the property market. The tide turned in August 2010, when Spaeth was introduced to an open-minded quantity surveyor from Johannesburg, who was looking at investing in an upmarket development. Gary Oudmayer was fascinated by Spaeth's iconoclastic sustainability beliefs and immediately saw potential in the development and the eco loft development finally took flight. The GBCSA launched the Multi-Unit Residential (MUR) PILOT rating tool in December of the same year.

As client representative on this project, Oudmayer says the investment in the CoCoon Eco Lofts was a departure from a traditional quantity surveying approach. "The client's mandate was to find something unique. As quantity surveyor, this was the first project I found myself looking at the actual application of products associated with the project and return on investment versus only looking at the costs."

Oudmayer based his evaluation on the merits of the long-term benefits associated with sustainability building principles as well as the proven escalated value attached to Green Star certified properties. Although initial capital expenditure and costs are high, Oudmayer believes that the constant increases in electricity tariffs and an elevated demand for environmentally friendly products, alternative energy resources and insulation solutions will ultimately chase the costs down.



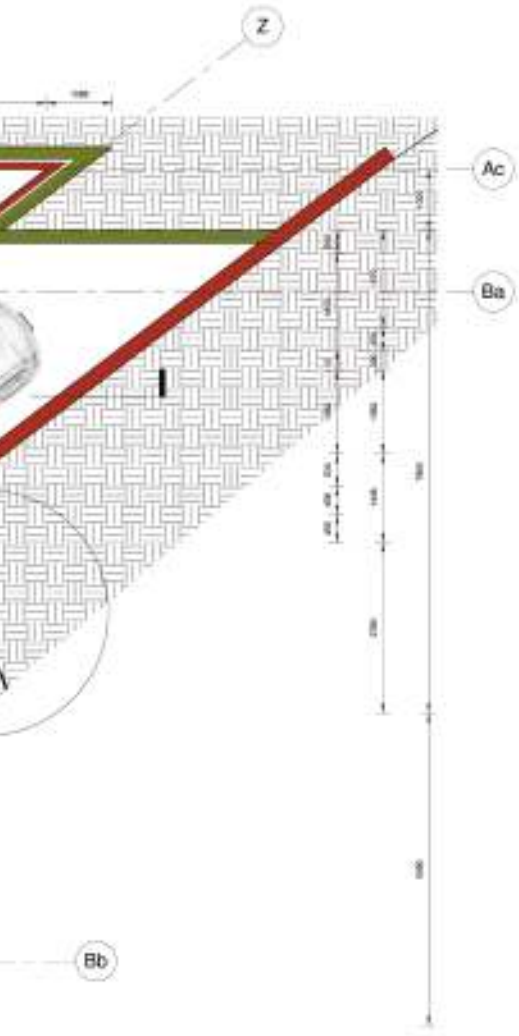
SUPPLIED: COCOON ARCHITECTS

THE PURSUIT OF BEING RATED

Spaeth attempts as far as possible to focus on fundamental design principles and keep technology, which can add up to a 30% premium on the build, to a minimum. Individual comfort is achieved through a high efficiency air conditioning system that is offered as an option but the building relies primarily on natural ventilation for thermal control. The lofts are well-insulated to minimise the need for artificial heating and cooling.

For maximum energy transmission, based on the R-value principle, the entire shell will be insulated. One of Spaeth's preferred insulation material is hemp but it isn't suitable to insulate wall cavities so insulation manufactured from recycled PET bottles might be used instead.

A well-insulated thermal envelope will give the lofts a high degree of comfort and also reduce the emission of greenhouse gases by eliminating the need to heat or cool excessively. The cavity brick



CoCoon Eco Lofts energy performance is in line with SANS 204: 2008 Energy Efficiency in Buildings

walls will have 25 mm insulation, the concrete roof slabs 50 mm above the slab and 100 mm below the slab. The timber frame roofs above the mezzanine levels will be insulated with 200 mm.

The design specifies large double-glazed windows, sliding doors and stacking-folding doors to promote natural ventilation giving the lofts a high degree of thermal comfort. Each apartment will have water and electricity meters displaying real-time consumption of the actual usage, consumption and savings.

High efficiency plumbing fixtures reduce the overall water consumption by 25%, which also mean a 25% reduction in effluent destined for municipal sewerage.

MATERIALS

Materials will be carefully selected to limit toxicity. All insulation materials and refrigerants used in the heat pump system will have zero ozone depletion potential (ODP). The choices made will minimise VOC levels, reduce the use of hazardous materials and encourage the use of low formaldehyde emission products.

The bricks specified are perforated Corobrik units with a void factor of 20% and made with a recycled paper sludge and ash mixture, which accounts for 33% of the brick's construction.

Steel which has a post consumer recycled content of 54% will be used to reinforce the concrete. The concrete contains 30% fly ash and industrial waste.

Green roofs will make use of topsoil which was stored and preserved before construction began. Only indigenous and non-invasive species requiring little irrigation have been identified for use in the roof gardens by the landscaping consultant.

Foundations and earthworks started early in May and the main contractor is due to move onto site in June. With the GBCSA MUR rating tool in place and CoCoon Lofts registered as a pilot, it seems as if Spaeth's dream to showcase sustainable architecture is turning into reality.

SOURCEBOOK

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SUPPLIED: OSMOND LANGE ARCHITECTS

40-ON-OAK: A PRODUCT OF THE TIMES

40-on-Oak draws on its location, a developer's vision and the timely launch of MUR PILOT tool to be the first 4-Star Green Star SA certified MUR project for Design.

A CHANGING TREND

Traditionally, architects pushed green thinking while clients remained conflicted between sustainable solutions with long-term saving benefits, and the initial cost of implementing alternative building methods. In a turnaround of these roles, the client, property development company AMDEC Investments (Pty) Ltd, wanted to go green. Amdec's head of sustainability, Josef Quraishi convinced the professional design team halfway through the design process in December 2010 to participate in the GBCSA MUR PILOT tool certification programme.

A PRODUCT OF ITS SURROUNDINGS

40-on-Oak is integrated into the Melrose Arch precinct which, according to Quraishi, was originally conceived upon new urbanism principles that opposed urban sprawl. In this regard, there were multiple elements in place that assisted the Green Star SA rating. Marloes Reinink, founder of Solid Green Consulting and a specialist in the certification of green buildings in South Africa, notes that the "number of urban design benefits – including mixed use, integration of amenities and access to public transport" all contributed to the certification. Solid Green was appointed to manage the Green Star SA process for the development.

Quraishi explains that the additional costs to achieve the 4-Star Green Star SA rating for the design of 40-on-Oak was less than 1%, which is

NUTSHELL

Location Whiteley Road/Oak Lane/Crescent Drive Melrose Arch, Johannesburg
Completion date November 2012
Configuration 5 storey building; 59 units ranging from 1 bedroom to 4 bedrooms; 5 penthouses on the top floor
Total gross floor area 11 505 m²
Total dwelling rentable area 9 131 m²
Total site area 4 660 m²
Price range R3.5 million to R25.5 million

SUPPLIED: OSMOND LANGE ARCHITECTS

lower than expected and could be attributed to existing green principles within the greater Melrose Arch precinct. Reinink says that the minimal additional cost in obtaining a Green Star rating is important, as this challenges the perception that going green is a costly exercise. But it also speaks to how the environment can influence a project's green credentials.

GREEN ELEMENTS

Reinink explains that "depending on the main structure of the building (either a concrete structure with reinforcement or a steel structure) the credit changes. The main structure of 40-on-Oak predominantly consists of reinforced concrete and we achieved three points there, meaning that we had more than 54% recycled content in the steel used in the building. High Density PolyEthelene (HDPE) replaced PVC plumbing and stormwater pipes, reducing the total cost by 30%."

Quantity surveyor for contractor Murray & Roberts, Louraine White, explains that sustainable timber for formwork was used on site and that FSC certified timber is specified in the building.

The thermal insulants used have a zero Ozone Depletion Potential (ODP). Politerm Blu Fein, an acoustic insulation free of chlorofluorocarbons, hydrochlorofluorocarbons and hydrofluorocarbons, and free of values able to sustain growth of fungi and bacteria, was used as a lightweight thermal screed for the roof and roof terraces. Drainage insulations and protection board manufactured from expanded polystyrene was used to create raised floors in certain areas.

Thermal comfort was an important consideration, as the Green Star SA sets the requirement limits through the predicted mean vote (PMV) and 80% acceptable limits were achieved for 40-on-Oak.

The airtightness test on how well the building is sealed will be conducted at the end of the project so air leakage must be minimised. This has a lot to do with the detailing of window frames and how the frames are installed into the walls. According to Reinink, South African buildings are notorious for their air leakage, resulting in elevated cooling and heating energy costs. She says "40-on-Oak aims to be air-tight, and the detailing has been done properly. This will reduce the need to heat or cool the spaces".

WASTE MANAGEMENT

An environmental management plan is in place to ensure that the environmental impact of the project is reduced. Special attention is given to site disturbance, oil and air pollution, water usage and construction waste. White says that "89% of all waste generated on the site is being recycled although the requirement is 70%. To date most of the rubble has been builders' rubble (concrete,

SUSTAINABILITY FEATURES

- Site located on a municipal approved urban edge
- Building management system with energy sub metering, water meters and smart metering
- All appliances have a minimum "B" energy rating though most have AA+ rating
- Hot water generated by gas and non-electric cooking appliances
- Common property management rules are visible to ensure energy efficiency, green cleaning etc.
- Naturally ventilated
- Carbon monoxide sensors
- Formaldehyde free engineered wood products
- Low VOC carpets and paints
- Urban heat island is addressed with large areas of landscaping and light-coloured roof paint
- No water consuming heat rejection systems are installed
- Organic waste facility: dedicated separation and collection of recyclables
- Parking bays: 5% dedicated to alternative fuel and hybrid vehicles and another 5% for motorbikes, mopeds and scooters
- Bicycle storage
- Swimming pools have pool blankets and a filtration system

bricks, mortar), but this is likely to change as we are starting with the finishes. More paper and plastic, and possibly more general waste like plasterboard will be generated during this phase so our recycling figures are likely to decrease. But we are confident that we can improve on the 70% target. A detailed report of the waste recycled and destined for the landfill is being kept".

A WORD FROM THE WISE

Architect Vernon Schroeder says that although architectural drawings serve as a reference, diagrams were needed to illustrate the principals of green design and demonstrate the building's compliance to these principals for each of the 59 apartments that best suited the specific green star requirements. In many instances, the tender plans and sections had to be changed to include the specific Green Star SA documentation requirements. In terms of time and cost, it is far more beneficial to the developer and the consultants to incorporate Green Star SA rating requirements at the design stage of the project," Schroeder adds.

Reinink specifically notes that on residential projects it is imperative "to design residential units with good natural daylight and focus on creating thermally comfortable spaces through passive design strategies. Naturally ventilated buildings score very well on the energy performance, and can achieve a MUR certification fairly easy if they ensure that the spaces are thermally comfortable through passive design strategies: good orientation, daylight and envelope design".

SOURCEBOOK

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Project Developer AMDEC Investment (Pty) Ltd. Josef Quraishi 011 684 0000 josefq@amdec.co.za
Quantity surveyor (site) Murray & Roberts Buildings Louraine White 011 456 1000 louraine.white@murrob.com
Sustainable building consultants Solid Green Consulting Marloes Reinink 011 447 2797 marloes@solidgreen.co.za

AMDEC is in the process of developing an 18 000 m² Green Star SA rated office building.

GREEN STAR SA – MUR v1

Behind the scenes:

The Green Star SA – Multi Unit Residential v1 rating tool assesses the environmental attributes of new multi unit residential developments, as well as major refurbishments of existing multi unit residential developments or conversions across South Africa. Multi unit residential developments include three or more dwelling units, common property, shared services and infrastructure among dwellings and an applicable management entity (such as body corporate, home owners association, management operator etc.)
There are two certifications awarded through the same tool: Green Star SA – Multi Unit Residential Design v1 and Green Star SA – Multi Unit Residential As Built v1 following construction completion.

Quraishi was impressed by the GBCSA and their assistance with a difficult process. Reinink says that the major challenge was that 40-on Oak was a PILOT project for the Multi-Unit Residential tool and that meant working towards a rating system that was not finalised fully. The GBCSA adopted the tool from Australia, and a team of experts adapted it for the South African context. The tool is tested on PILOT projects to identify problems and iron out issues, and based on feedback from the PILOT projects, the GBCSA adjusts the tool and releases a version 1 tool. The tool as it currently stands, is very different to the pilot version - indicating the true value of PILOT projects and teamwork.

Impact

Spaeth says that the Green Star PILOT rating had such a positive impacted on the investors that in a complete turnaround, they now not only want the Design rating, but are on board to ensure an As Built rating.

Quraishi adds that tenants, businesses and home owners are now the real drivers of change. This is clear from the volume of responses received after 40-on-Oak was certified: existing and potential tenants want to know how to go green.
www.gbcsa.org.za/greenstar/mu_residential.php