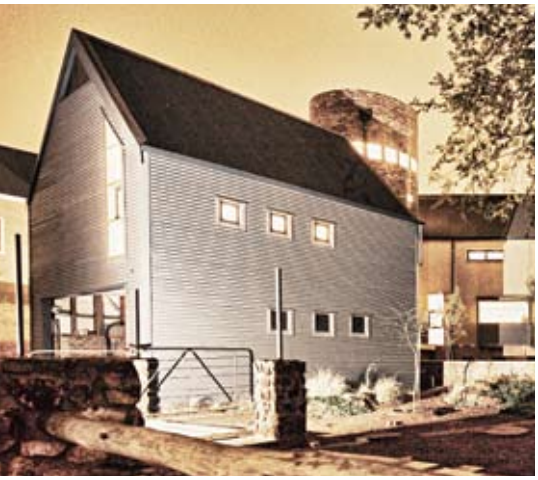
The renaissance of CORRUGATED METAL ROOF SHEETING

Safintra Roofing's "Great South African Marketing" campaign debuts its third theme in this issue of ***Walls & Roofs***, featuring a remarkable home in Southdowns Estate in Irene, Pretoria. The house was designed by the talented duo Johann and Friedrich Strey of Strey Architects. The home is not only the residence of Strey, but will have a double function and will serve their architectural practice. Called the Barn House, it is built in the contemporary farm style vernacular and is far more than just an architectural masterpiece. It also sets a new standard for sustainable living.

Southdowns is an eco-estate that forms part of the Irene Dairy Farm, where vast areas of pastures were retained for agricultural use by the original farmland owners. The estate is set in a dolomite



region with the potential to form sink holes when water can't run off. Strey Architects cleverly dealt with this potential problem by creating a reinforced concrete and brick core for the building that sunk down one storey. By extending well beneath ground level, it not only acts as a bridge in the eventuality of a sink hole forming, but it can also be utilized as an interior space (in this case a wine cellar and the company's offices). The space was also used as a service hub for all household eco-systems, like rainwater harvesting, grey-water storage tanks, solar under-floor heating manifolds or home automation systems.

South Africa has an abundance of sunlight. The company embraced this by using renewable energy sources for domestic use as well as under-floor and pool-water heating. Vacuum-tube and flat-panel technology, which have been in use in Europe for over 30 years, were incorporated into the north-facing roof, and the roof-fitted photovoltaic panels ensure that most appliances operate off-grid. Southdowns Estate Developers have also negotiated the channelling of natural gas from the main line running near the estate to each stand, which adds to the energy-efficiency of homes in the estate.

The house itself is a contemporary interpretation of the local farm-style vernacular, incorporating elements and structures found on a farm as an analogy. The main structure is an insulated "barn", clad in timber decking, with rigid polyurethane board insulation, using glass wool or foil insulation under the concrete floors, the walls and roof where appropriate. The windows are all double-glazed which, although more expensive initially, will ensure a huge cost saving on the long run by regulating interior temperatures.

Ancillary structures on the property, such as the garage, are all corrugated clad to resemble structures on a farm. "The lap pool is an analogy of a drinking trough for cattle and is positioned upwind in order for a breeze to gather the cooled evaporated air in summer and blow it through the house, thus passively cooling the house," says Strey. The structures are "placed" around a cylindrical brick stair shaft and entrance hall, resembling grain silos found on farms in the Free State. The surrounding landscaping consists of an indigenous garden to the north framed by a very old stinkwood tree. Careful landscape planning ensures that different plants will be in full bloom throughout the different seasons, with little need for irrigation.

The role of metal roof sheeting and its use in the harvesting of rainwater have made a major comeback in green design and architecture. Water shortages in the near future are a fact, and careful consideration was given to the harvesting of rainwater and the recycling of water in this project. Rainwater can only effectively be harvested using steel roofing, and the sophisticated paint coating used on Colorplus (SAFAL Steel) or Clean Colorbond™ (Bluscope Steel) sheets is self-cleaning, ensuring the minimum water contamination. In keeping with the farm-style theme, corrugated water tanks collect rainwater, which is used for domestic water use, the garden, flush toilets and the swimming pool.

Rodney Harber, chairperson of the KwaZulu-Natal Institute of Architecture (KZNIA) Heritage Committee, cites the prime reasons for the renaissance of corrugated roof sheeting. One key reason for using the sheeting is the effective use of metal roof sheeting in the collection of rainwater. According to Harber, there is no doubt that corrugated steel sheeting is an excellent material for rainwater harvesting purposes, particularly in rural areas where the technology is understood. "The second reason for using corrugated renaissance is the architectural benefits, as seen in the vernacular of Southdowns Estate."

Harber explains that corrugated metal sheeting had a major impact on colonial architecture in South Africa. It could be readily transported on wagons, stacked tightly and securely, was quick and easy to erect on a timber framework, and offered excellent protection from break-ins. "Rainwater harvesting was the norm and roofing materials that facilitated harvesting became entrenched in the architectural style of these times." He adds that another major advantage of steel was that it could be reused (or repurposed) if necessary, as a platform for ripening pumpkins, forming rainwater tanks and even for boundary walls. "It is ironic that, in order to preserve precious resources, we are returning to the way things were done before."

The Department of Public Works now requires architects to design new public buildings to conform to the guidelines of the Green Building Council. For example, toilets need to be flushed with wastewater, generally augmented by rainwater.

Strey says that they strived to set an example for South Africans by experimenting with high-tech and low-tech solutions in order to minimise their impact on the earth, without compromising on aesthetics and lifestyle. "We hope this project will inspire others to push the boundaries of architecture, and motivate the public to seek out a like-minded and knowledgeable architect to help them fulfil their dream while doing their bit for the future users of the world, our children."

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