

zedfactory ltd[®]
www.zedfactory.com or www.zedstandards.com

Practice Profile





All ZED schemes fuse good urban spaces with communal uses and solar orientated buildings

Practice philosophy

Bill Dunster architects ZEDfactory Ltd (BDa ZEDfactory) is an award winning practice specialising in low energy, low environmental impact buildings. BDa ZEDfactory's projects range from private commissions to wholesale communities. Within the wider context of sustainable development we are committed to good quality design based on careful analysis of end user needs.

Our approach is one of innovative use of tried and tested technologies to deliver buildings which are stimulating and practical on a daily basis, and distinctive, economic and reliable in the long term. Buildings are homes and places of work, and are a powerful influence on the quality of life of individuals and communities. BDa ZEDfactory gives high priority to achieving the right balance between human issues and technical disciplines.

Our services

BDa ZEDfactory offers the full range of RIBA services including:

- Architecture: social housing, private housing, education, leisure, commercial, ZEDs (Zero fossil Energy Developments)
- Masterplanning
- Urban design
- Landscaping.

Formed in 1999, BDa ZEDfactory has offices in BedZED, the unique carbon-neutral live-work community in the London Borough of Sutton, designed by the practice and completed in 2002.

Low-energy, low-environmental impact approach

BDa ZEDfactory believe that sustainable development is both affordable and achievable within current market constraints.

Our design approach integrates as many building elements as possible into construction. This results in fewer components and finishes being needed. The associated cost savings allow a higher specification for low-energy and low-environmental impact components.

Renewable energy devices and passive energy features are an inherent part of our design thinking. Structural considerations and fixings are determined during design, so that components can be added later as required, rather than as an expensive afterthought.

The practice keeps up-to-date with both the technologies and performance parameters that influence building design. This enables us to use appropriate energy-saving and low-environmental impact devices to suit our clients' practical needs. We aim to create beautiful structures that express the natural elements they seek to harvest.



Above: BedZED as it looks today after 4 years of occupation. The pallet of natural materials was chosen to age gracefully with minimal maintenance.



Left: BowZED - proof that a full Zero Energy Development can be achieved on a tight urban site by a commercial developer - Winner of a Housing Design Award 2005



Above: The gable end treatment of BedZED introduces a new urban typology using local traditional materials.

Left: The interiors of BedZED have been very well received by potential buyers of the homes for their light, scandinavian feel and natural materials



title **Beddington Zero (fossil)
Emissions Development
BedZED**

client **Peabody Trust**

value **£14.5m**

dates **Completed June 2002**

BedZED is the UK's largest mixed use, carbon- neutral development. When it was built in 2002, it set new standards in sustainable building. BedZED comprises 82 affordable dwellings in a mixture of flats, maisonettes and town houses, and approximately 2500 m2 of workspace/office, and is built on a brownfield site. The BedZED urban system reconciles high-density with amenity, providing each dwelling with a sky garden or terrace.

A combination of passive measures and proven, cost effective active technologies form the strategy of an integrated, sustainable development. A rigorous specification process helped reduce the environmental impact of the construction process. The scheme includes a biomass combined heat and power plant, an on- site sewage treatment and rainwater recycling system, and natural wind driven ventilation.



Below: The section through the BedZED scheme underpins the whole ZED approach - Solar orientation with homes facing south & workspaces north with skygardens on their roofs. All upper roofs are green sedum and there is a full range of unit types and tenures



BedZED's wood chip combined heat and power unit



BedZED's living machine on-site sewage treatment plant

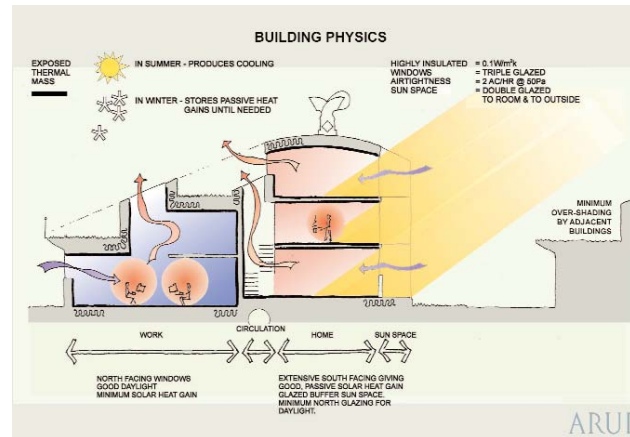


All brought together in one building with sports facilities



Above: BedZED's skygardens

Below: ARUP's building physics diagram of BedZED





Above: CHRC concept render

Below: Frame September 2006

Below: Aerial view showing proven turbines



title **Croydon Healthy Resource Centre (CHRC), South London Mixed Use Community Building**

client **Metropolitan Housing Trust**

value **£2.75m**

dates **On site now**

A mixed-use, affordable housing scheme, with 16 one- and two-bedroom flats above two floors of community facilities. All units will meet the Housing Corporation Scheme Development Standards (SDS). 60% will meet Lifetime Homes and EcoHomes 'Excellent' standards.

CHRC will be the first building in the masterplan development of a large urban site, and its form reflects the complex site constraints. It is a 5-storey, steel frame building with precast concrete hollow core floor decks, thermally massive inner leaf construction, and superinsulation throughout. Wind cowls assist the natural ventilation with heat recovery. The low-energy strategy is to deliver 40% reduction of carbon emissions using a biomass boiler and roof-mounted wind turbines. The scheme is a zero parking development.

Below: CHRC concept sketch



title **BowZED - Residential Units**

client **Yorklake Ltd**

value **£ 500 K**

dates **Completed August 2004**

BowZED is a block of 4 flats, just off the Bow Road in East London. Each flat benefits from its own south-facing terrace and conservatory, which have enough photovoltaic cells incorporated into the glass to meet at least half of the occupants' annual electricity demand. The other half is planned to be met by a recently installed micro wind turbine mounted on the communal stair tower. This building will generate as much energy from renewable sources in a year as it consumes.

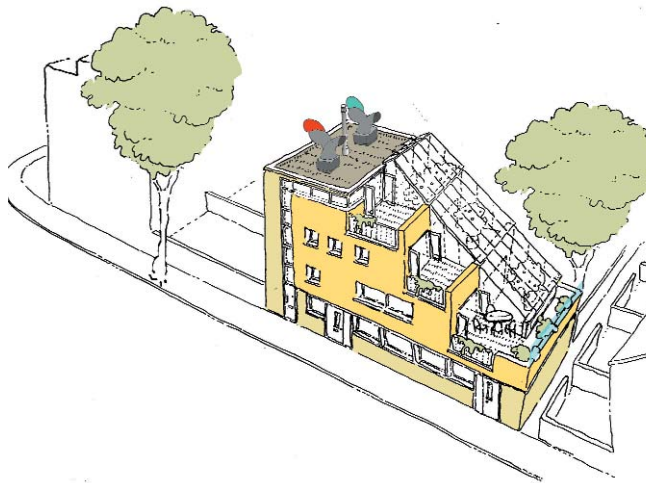
Finished to the high levels you would expect for a modern urban 'for sale' development, the building has also been built to ZEDstandards. This means the levels of insulation and thermal mass are such that no central heating system is required. The flats obtain enough heat from occupants, the solar gain from south-facing windows, and incidental gains from cooking and appliance use. This enables a single 15kW wood pellet boiler to supply the whole block with hot water and back-up heating.

This building shows how a Zero (fossil) Energy Development (ZED) can be delivered on a tight urban site as a conventional development opportunity. The sales prices for the flats achieved by the developer were better than expected, and well above local comparable property showing there is a healthy appetite for eco-housing in the market place.



Above: BowZED's PV laminate glazed sunspaces

Below: Glazed laminate casting shadows on a clean bright interior



Above: BowZED concept sketch





Below: Shop space

Above: Earth Centre shop/cafe at night



Above: Cafe deck

title **Conference and Arrivals Buildings,
Earth Centre, Doncaster**

client **Taylor Woodrow**

value **£2.2m / £450k**

dates **Completed Jan 2002**

The brief for the new building at the Earth Centre called for a state-of-the-art, naturally ventilated and overtly sustainable design solution, to complement the vision and aspirations of the Centre itself. It was procured under a design and build contract, and within the parameters of a strictly limited budget and tight programme schedule.

From the beginning, the design was driven by the functional demands of the Centre, addressing their needs in terms of access, image and education. The brief also called for an unique auditorium space to create a memorable and flexible venue. The design solution offers level access to all floors. Detailing and structural methods were such that local labour skills and local sources of material could be used.

The Arrivals Building (shown on this page) is located to the south of the site, across the river Don from main activities. It welcomes visitors arriving by train or car, and offers ticketing facilities, a shop, and a cafe area, as well as a viewing deck over the river.

With a mostly transient occupancy, the building's design concentrates less on heat loss, and more on pleasing and functional space. The structure is contemporary, and maximises natural light and use of reclaimed materials.

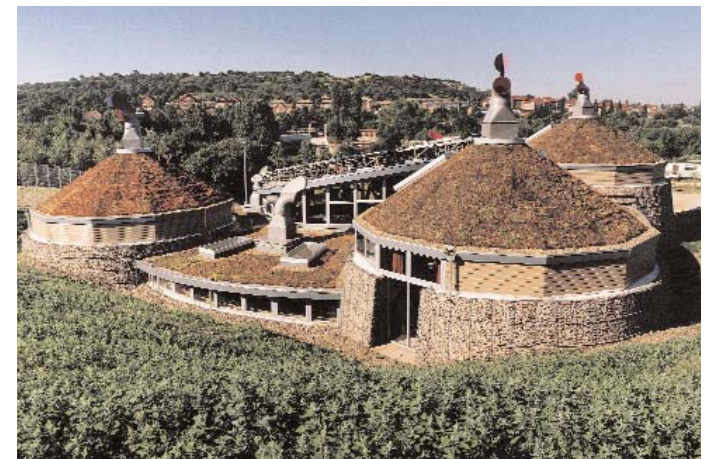
Pictures of the Conference Centre are shown on the next page.



Above: Aerial view of Earth Centre



Above: Auditorium



Above: 3 views of conference facilities



title **Jubilee Wharf**
Penryn, Cornwall

client **Robotmother Ltd**

value **£3m**

dates **Completed Summer 2006**

Jubilee Wharf is a mixed-use scheme on the riverside. It comprises a nursery, bar/cafe, offices, live-a-board facilities, external public spaces and landscaping, 12 rented workspaces, and 6 residential units with external balconies.

Due for completion in Summer 2006, the scheme has received Sure Start funding and private funding. The scheme features a wood pellet boiler and 4 wind turbines, and will be a Zero (fossil) Energy Development. The wind turbines will generate most of the expected electrical demand, and all the space heating and hot water needs.

The client is committed to using local materials and reclaimed or recycled wherever possible. It will have local art integrated into the construction, and art for sale in the lettable workspaces.

Jubilee Wharf recently featured on BBC2's 'The Culture Show' as a good example of sustainable building.





Clockwise from above: Zinc clad against the marine environment - Rear of development - Turbines in motion - Multi use space - View along Commercial Road





title **Linden Glade ZED**
Halesowen, Dudley

client **Accord Housing Association**

value **£1.4m**

dates **Completed September 2005**

This social housing scheme comprises 15 2-bed flats and 1 communal room for use by the residents and the adjacent scheme. The terrace design is stepped in order to take up changes in site levels. The site is a small land-locked site in an urban area near Birmingham.



Space heating and hot water is provided by a wood pellet boiler that is self igniting and fully automated. The scheme also features all of the basic ZED construction principles such as a south aspect and super-insulation. Clearskies funding was obtained for the wood pellet plant, and local supply chains are being set up for use on ZED schemes in the area.

The client hopes to replicate the scheme on other sites using the same team, optimising the experience from the scheme.



Hope House, East Molesey

For

Bill & Sue Dunster



Hope House, built in 1995, was the first experimental 'ZED'. Regular upgrades improve energy use as the latest technology advances become available. A log-burning stove was installed in 2004, and a wood pellet boiler will be fitted in 2006. Together they will replace the gas boiler for hot water. A micro wind turbine was fitted in 2005, which generates about 50% of electricity needs, and the existing PVs also supply around 50%. As Hope House is home to Bill and Sue Dunster, it allows them to experience and evaluate components first-hand.

Bath Springs, Bath

For

Private Client

Bath Springs is a private commission for a country house. It uses the steep escarpment of the site, thus avoiding agriculturally useful land. Its setting befits its the status of the house, with a commanding presence over the site. A wind turbine, PV and biomass boiler, along with full ZED fabric construction make it a carbon-neutral executive home. It is currently in planning.





title **RuralZED kit house**

client **BDa ZEDfactory Ltd**

value **£75k** (for mid-terrace unit)

RuralZED is a new innovative housing system which brings together the speed and quality of lightweight Modern Methods of Construction (MMC) with the benefits of heavy weight thermally massive construction at an affordable price. From single storey to multi-storey the flexibility and simplicity of this high performance building fabric makes variations on internal space and external appearance easy. In addition to a bright healthy indoor environment the RuralZED concept has fully integrated renewable micro-generation technology (and upgrade path) to a Zero Energy Development (ZED). The system is ideal for the volume builder or self-builder who wants to stop climate change and build a sustainable healthy future.

Images on the next page show how different ruralZED house types can be used together to create an aspirational zero (fossil) emission community





Clockwise from Above: Computer-generated view from the South East showing the park side towers - Proposed maisonette - Proposed urban block incorporating the existing slab block

title Kings Crescent, Hackney
Estate Regeneration

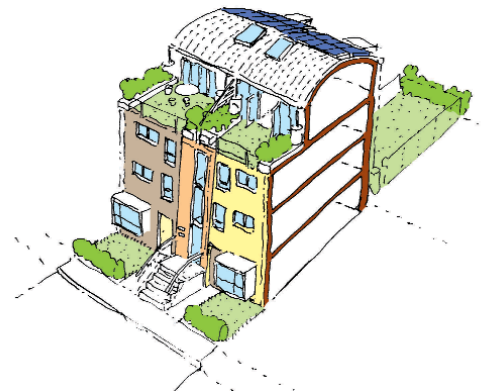
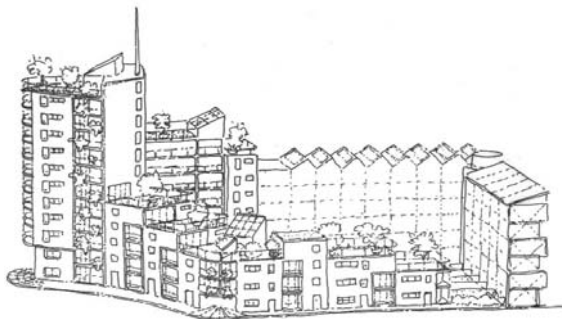
client Peabody Trust, Ujima, Unitary

dates Preferred bidder 2001 - 2003

Kings Crescent is a late-60s estate in Brownswood district of Hackney. It was made up of system-built towers and a mixture of slab block and terraced housing, laid out around a number of squares which are used as service yards. It has suffered from a lack of maintenance and management, and problems with drugs and prostitution have built up over the years. The interior layouts of the majority of the flats are well designed and liked by their residents.

Our role was to work with landscape designer, West 8, to meet a brief that required a master plan and energy-efficient building designs. Site regeneration had to be achieved without external financial input. This was to be primarily achieved by increasing the density, and by adding market sale accommodation, most of which was to be in three new towers overlooking the park.

Although the consortium was successful in becoming preferred bidder, the project did not go ahead. Reasons for this include, we understand, the residents' vote to reject the increase in density.



title **St Matthews Key Worker flats**
Estate Regeneration
(a PRPZEDfactor Project*)

client **Presentation H A**

dates Completed **2005**

Working under the name of our Joint Venture company PRP ZEDfactor St Matthews Key Worker flats is a block of 12 new build flats built on an infill plot as part of the wider masterplan to regenerate the St Matthews Estate.

The block has been designed to ZEDstandards and hence has zero space heating requirements. Domestic hot water is provided by a combination of a single wood pellet boiler and solar thermal panels. It also has a pre designed upgrade path to full Zero Energy status.

This project attempts to promote ZEDstandard construction in the Housing Association mainstream and draws on the vast HA experience PRP have acquired over years of client focused projects.



Clockwise from above: 'elevation to Brixton Water Lane -the solar thermal array -a sunspace and balcony providing additional living space



*PRP ZEDfactor is a joint venture company formed in 2002 with the large housing architectural practice PRP. Its primary aim is to introduce ZEDstandards to a wider client base, especially for clients who require the security of working with a large practice such as PRP.



Above: Aerial view of development

title **Artist's Way ZED**
 Housing development

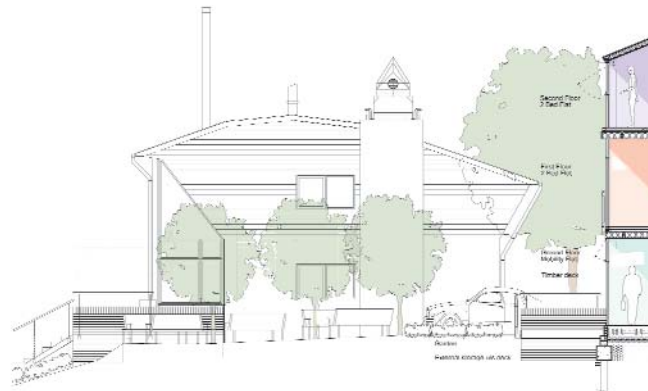
client **Testway Housing Association**
 (Part of Aster Group)

value **Approx. £2m**

dates **Due to Complete Spring 2007**

This small site on the edge of the town centre will contain 5 houses and 12 flats in a residential scheme. It is designed to be innovative and energy efficient, incorporating our expertise and technology to reduce the need for fossil fuels, while producing housing that increases the quality of life for its residents.

Above: plan render of development



Above: sectional view



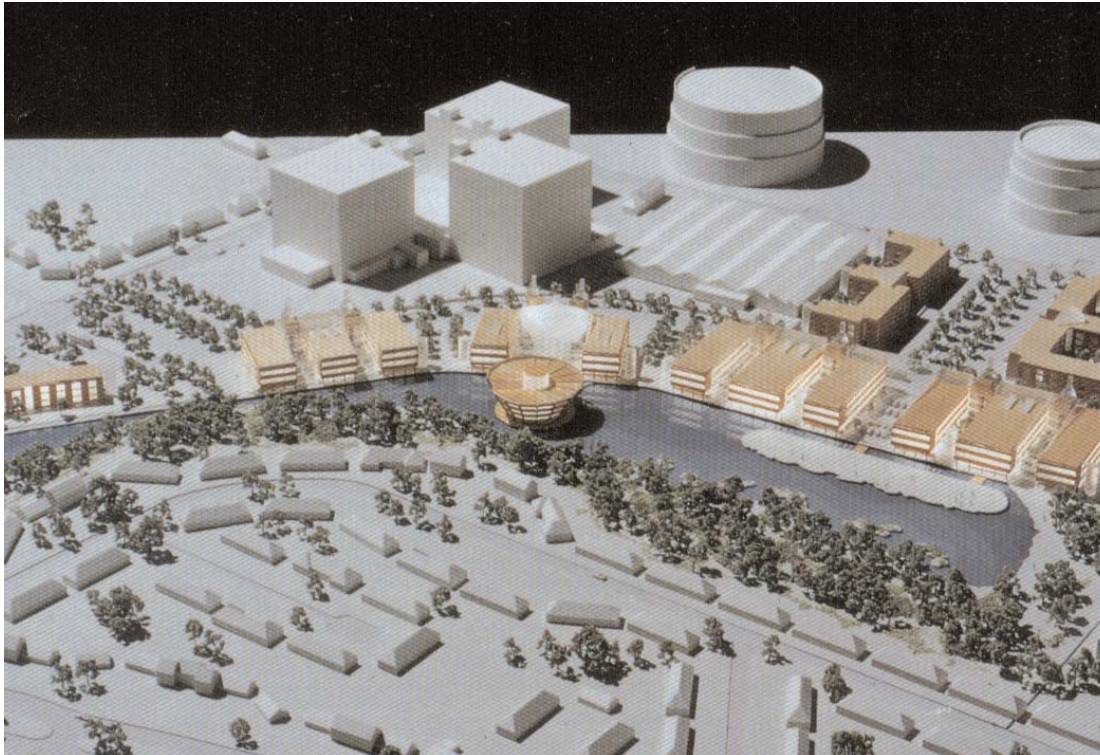
title **Nottingham Jubilee Campus**

client **Nottingham University**

value **NA**

dates Completed **September 1999**

Bill Dunster was responsible for designing this competition-winning scheme while at Michael Hopkins and Partners. He saw the project through all phases of design and construction.



Above: View of the completed campus buildings (Awarded the **RIBA sustainability prize 2002**) & A model of entire campus development



Above : an aerial view from the south.

Below: Demo area masterplan



Below: Southwest-cut away view



title **Changsha**
Changsha ZEDquarter demo building

client **Modern Group**

dates **Summer 2007**

Changsha ZEDquarter - is a new urban expansion in this regional city, capital of Hunan province. This is a new masterplan for about 14 ha. We are building a demonstration community building complete with sales area, exhibition, small hotel and bar, offices, showflats, a conference facility / cinema, bar, restaurant and sports facilities including a swimming pool.

The urban block enclosed reduces the urban heat island effect and allows the heat pump cooling system for the homes to be powered by solar electricity, with undulating landscape gardens covering mixed use commercial and community facilities including a covered farmers market. A biomass combined heat and power plant fuelled by rice husks will be installed as the number of completed homes provides sufficient critical mass.

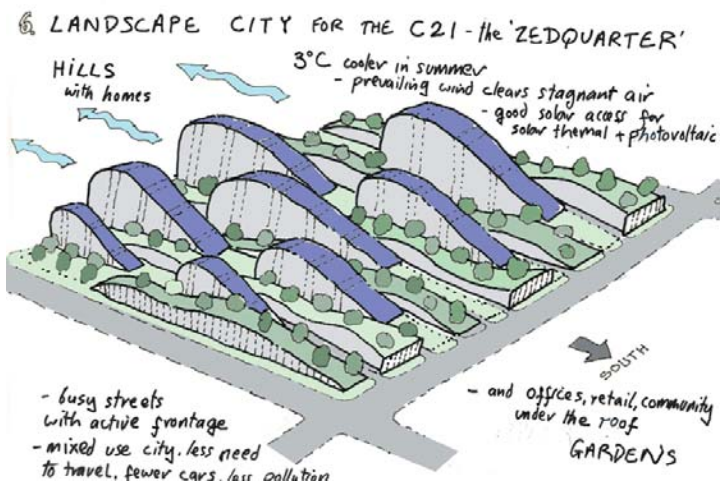
Specially modified wind driven ventilation cowls integrated into the balcony structures encourage cross ventilation without using electricity, with passive heat recovery and superinsulation on the BedZED model used to achieve a step change reduction in demand for both summer cooling and winter heating.

The residential density will be between 120 and 150 large two and three bed homes / ha, with considerable commercial space and lively shop lined streets. All parking is below the residential blocks, with only zero emission pool cars above ground for convenience.

A mountain bike training track climbs over the roof gardens, showing how high densities good amenity and opportunities to take exercise can be achieved around public transport nodes, minimising the need for private car use. It is hoped that this type of alternative relatively low rise urban model will replace the energy intensive tower blocks prevalent in many Chinese cities.



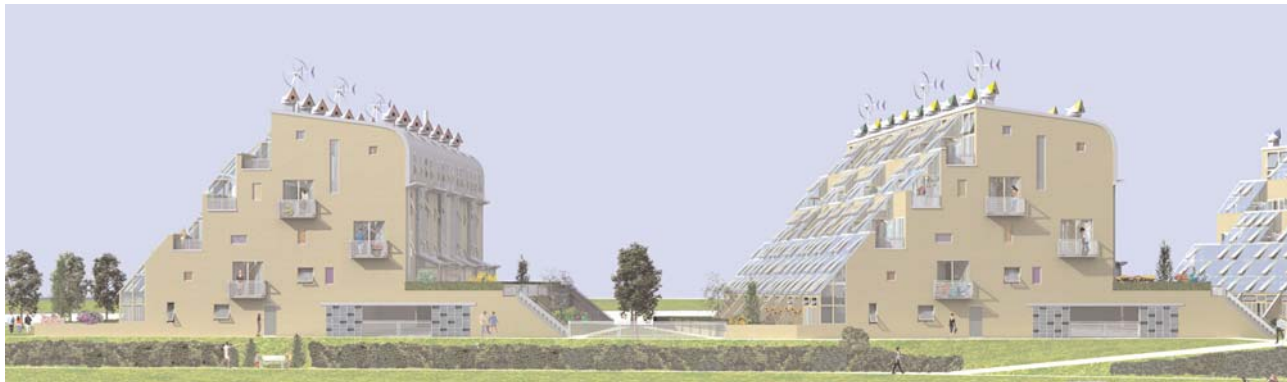
Clockwise from above: View from the landscaped roof. - Urban masterplan concept - Urban masterplan concept sketch - Southern eye level view





Above: Aerial view from the North-East.

Below: Canal side elevation.



title **Leicester Abbey Park Road
Solar Urban Blocks**

client **Metropolitan Housing Trust**

value **£15m**

dates **On site Jan 2006**

The latest government Energy White Paper proposes a 60% reduction in national CO2 emissions from mid-1990 levels by 2050.

The redevelopment of the old Leicester bus garage site will set new standards for affordable homes by meeting this target on completion of the final phase. This assumes that the project is successful in attracting appropriate grant funding for some of the building integrated photovoltaics. Even if this is not the case, the building design facilitates the future on-site installation of low-carbon power generation technologies, as they become commercially viable. This is expected to be within the next 8 to 10 years.

The concept is to reduce heat and power requirements, to the point where it becomes affordable to meet 60% of the building's energy use from renewable energy sources, generated within the sites boundaries. The site will do this by using ZED passive standards for airtight, super-insulated building fabric with heat recovery ventilation. Zero-heating specification homes will then incorporate a mixture of biomass fuelled heating, photovoltaic electric generation, domestic scale micro wind turbines, passive solar gain, thermally massive passive cooling technologies, and wind driven ventilation with heat recovery.

The masterplan allows future upgrades to site-wide biomass combined heat and power, or fuel cell generation systems.



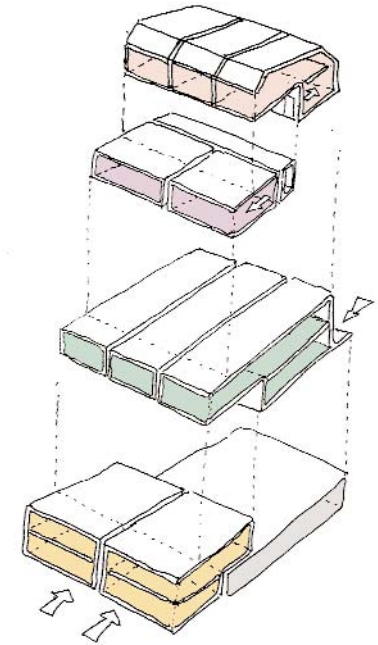
Clockwise from left:

View from South

- Sketch of separate dwellings in each block

- Cutaway of single unit

- West view showing parking



Every home has a south-facing living room





title **Forest Forever**
Housing Development in
Beijing, China

client **Modern Group**

dates **Planning July 2005**

This housing development is to set up the first carbon-neutral community in Beijing, China, within a spectacular environment between city and country. The project promises a community with a relaxing balance between working and living.

The basis of ZED design is to reduce the need of cooling and space heating by investing in a high performance building fabric. This includes super-insulation and thermal mass, and reduces energy loads by using integrated renewable systems relying on sun, wind and ground water.

Every home is south facing, creating a great feeling of space and light inside buildings. The sunspace serves as a solar heat collector in winter. All homes have a private exterior space, which may be a garden or terrace space.

The landscaping includes a 'forest' area, situated at the edge of site, in which residents are able to exercise and relax. A waterscape runs through the centre of site. Starting at high level on the commercial building, reed beds filter the water as it flows down into the recreational parkland and fishing pond between villas. The water is pumped back up-hill by a wind-pump.



Above left: An image of the feature fishing lake and villas.

Left: A view over the central recreational area towards the townhouses, and behind the apartments and commercial buildings.



Clockwise from left:

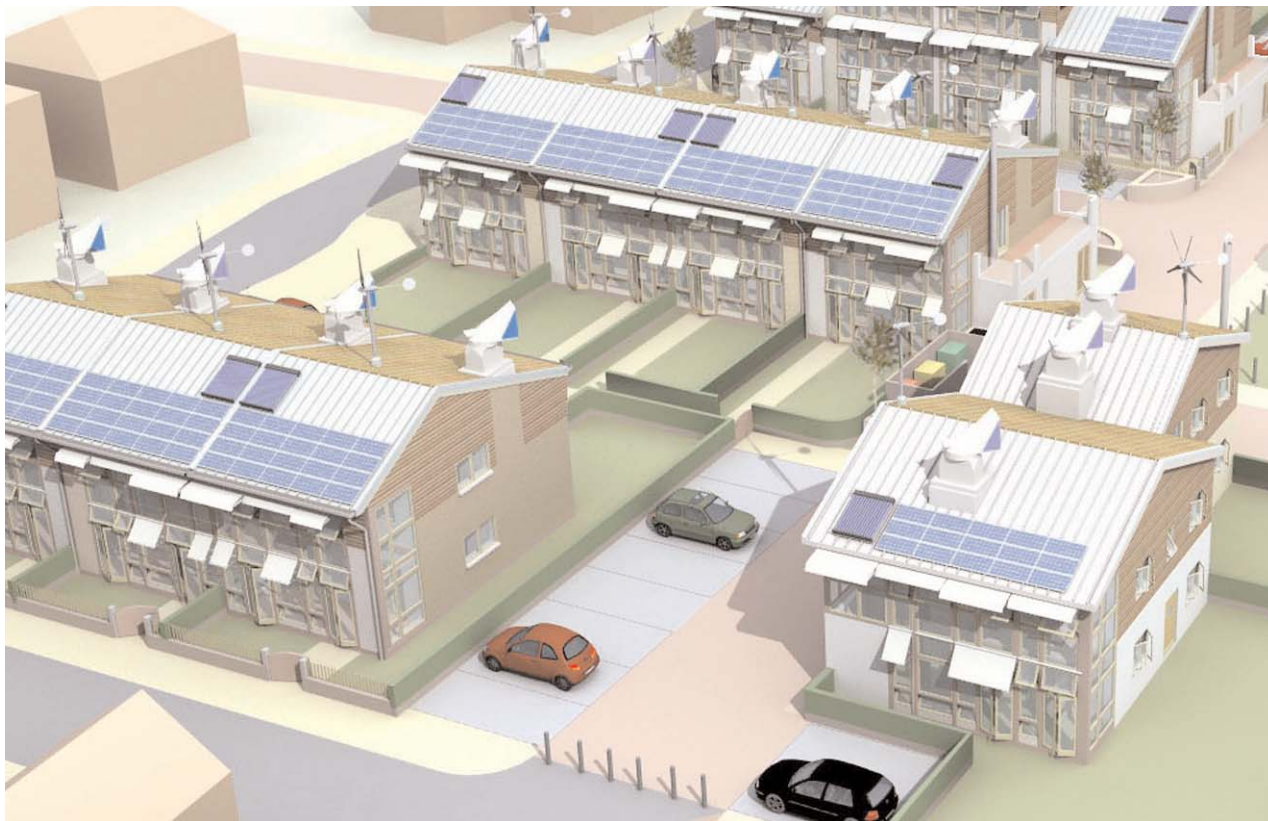
View between two rows of apartment blocks, showing communal courtyard space between the buildings.

- View of villas and the feature lake which the residents are able to fish from.

- An aerial view of ZED Forest showing its setting.

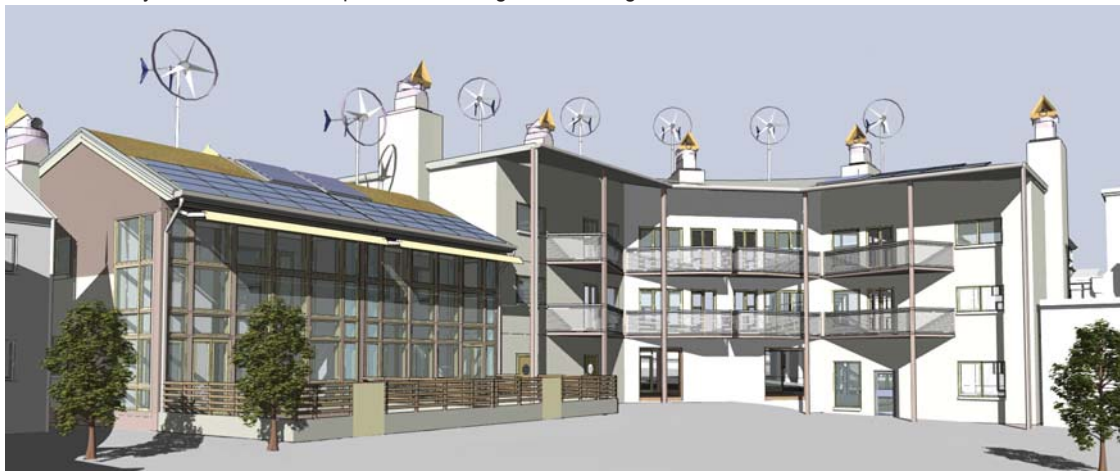
- The north entrance, 'ZED Forest' with the commercial units.





Above: View of typical block with ZED units highlighted in colour.

Below: Courtyard view of corner apartment building, and housing.



Below: Phase 1 - a 6 unit terrace



title **Upton Site D1, Northampton Housing Development**

client **Metropolitan Housing Trust**

value **circa £36m**

dates **On site March 2007**

This project was the result of winning a competition set by English Partnerships, with MHT as developer. The scheme is for the new town centre of Upton, with approaching 350 units in total, of which most will be private for sale.

BDA ZEDfactory is both 'sustainable construction' consultant for the whole site, and designing 25% of the units (around 90). All units, the remainder being provided by local architects, are to be designed using the ZED fabric standards.

A competition requirement was for 25% of the units to be designed using Modern Methods of Construction (MMC). BDA ZEDfactory is designing all the MMC units using the RuralZED timber frame system. Approximately 50 will be a mix of family houses and mews dwellings, and the remainder are 1- and 2-bedroom flats.



Clockwise from left:
Residential wind-focus
buildings looking over
main square, with visitor
centre in between.

- Mews view
- Rooftops of units
designed to benefit from
microgeneration.



Awards List

Stirling Prize 2003

Shortlisted Main Prize & Winner of Sustainability Award

RIBA London Awards 2003

Winner Special Awards - Sustainability

Housing Design Awards 2003

Winner - Best Project & Sustainability Award

EU prize for contemporary architecture 2003

Nominee - Fundacio Mies van der Rohe Award

Evening Standard Lifestyle Award 2002

Winner

Energy Globe Award 2002

Winner

Eurosolar Award 2002

Winner

The World Habitat Awards 2001

Finalist

Other Citations

Prime Minister's Better Public Building Award

The Conference Building, Earth Centre,
Finalist in 2002

Design Sense Award

Hope House shortlisted 1999 by the Design Museum

RIBA Downland Award 1996

Hope House shortlisted

British Council Delegations

⌘ China, Beijing

⌘ China, Shanghai

⌘ Los Angeles

⌘ Japan

Bill Dunster's CV

Date of Birth July 9th 1960

Nationality British

Higher Education MA Hons Edin.
Degree Course at Edinburgh University

Following several years of research and development into high-density sustainable housing, Bill presented the BedZED scheme, a carbon neutral live/work community, to the Peabody Housing Trust. In early 1999 suitable land was found in the London Borough of Sutton, and both the BedZED project and Bill Dunster architects (BDa) were born.

Since 1999 the practice has completed a number of award winning building projects.

Prior to setting up BDa, Bill was an Associate at Michael Hopkins and Partners, and was with the practice for 15 years, specialising in low energy and sustainable development.

July 95 - July 1999 Nottingham University New Jubilee Campus was the final project Bill completed as an associate for MHP. He took the scheme from the initial competition bid through to completion. Opened in December 1999 by HM the Queen, the campus has since been awarded the Stirling Prize, Sustainability Award 2001.

Aug 92 - July 95 Before Nottingham, Bill developed the environmental strategy and detailed façade design for Portcullis House. This work followed 4 years of research in the European Union funded Joule Research Project, collaborating with the leading environmental consultants in Europe, including Arup, CSTB Nantes, Christian Bartenbach and Conphoebus.

July 90 - Aug 93 Bracken House redevelopment, City of London.
Contract value £85 million. Senior architect

Bill has also taught at the Architectural Association and Kingston University. He speaks regularly within the UK, and has been a member on a number of overseas British Council delegations to China and Japan.



photo - Morley Von Sternberg



New parliamentary building, London



David mellor factory at Hathersage Derbyshire

Chris Wilford

BSc Hons ARB RIBA

Chris registered in 1989 after completing his studies at Oxford Polytechnic and the Institute of Urban Studies in Alexandria, Washington DC. He has worked in London and Hong Kong, and prior to joining ZEDfactory in 1999, spent five years with Bothe Richter Teherani architects in Hamburg. There he worked as a senior architect on a wide range of advanced technology buildings, and attaining fluency in the German language. Chris was the project architect on the Earth Centre conference building.

Asif Din

Ba Hons Dip arch RIBA

Asif studied energy efficient building with Robert and Brenda Vale and Sue Roaf before joining ZEDfactory. Asif has also worked with a range of research groups including Royal Melbourne Institute of Technology (RMIT), Australian Greenhouse Office (AGO) and Mobile Architecture and Building Environmental Laboratory (MABEL). At ZEDfactory Asif was employed to detail BedZED and since then has been involved on a range of projects from SkyZED to Jubilee Wharf which he was site architect for in Penryn in Cornwall. He is also involved in ZEDproducts development such as the wind cowl and has undertaken academic lecturing and teaching at various academic institutions from Deakin University in Australia to University of East London. He has previously worked for T P Bennet Partnership on a wide range of commercial projects prior to his diploma course.

Steve Harris

BSC Hons DipArch (UCL) RIBA

Steve Harris has been working with Bill Dunster since 1994, firstly at Michael Hopkins and Partners, and from 2000 at ZEDfactory. He has been involved with BedZED since its inception, originally working on the project privately for Bill when they were both at Hopkins. Currently he is project architect for a number of projects and has cross office input on construction detail and energy systems. He has also been involved in a number of studies looking at energy payback and building physics.

Between 2002 and 2005 Steve also took on a role as a Senior Lecturer in Environment and Energy at East London University School of Architecture and the Visual Arts. He is a member of the Hackney Sustainable Development Group for Hackney Council and has undertaken external representative roles for the GLA.

From 1988 and 1993, Steve studied at the Bartlett School London (UCL) and qualified as an architect in 1996.

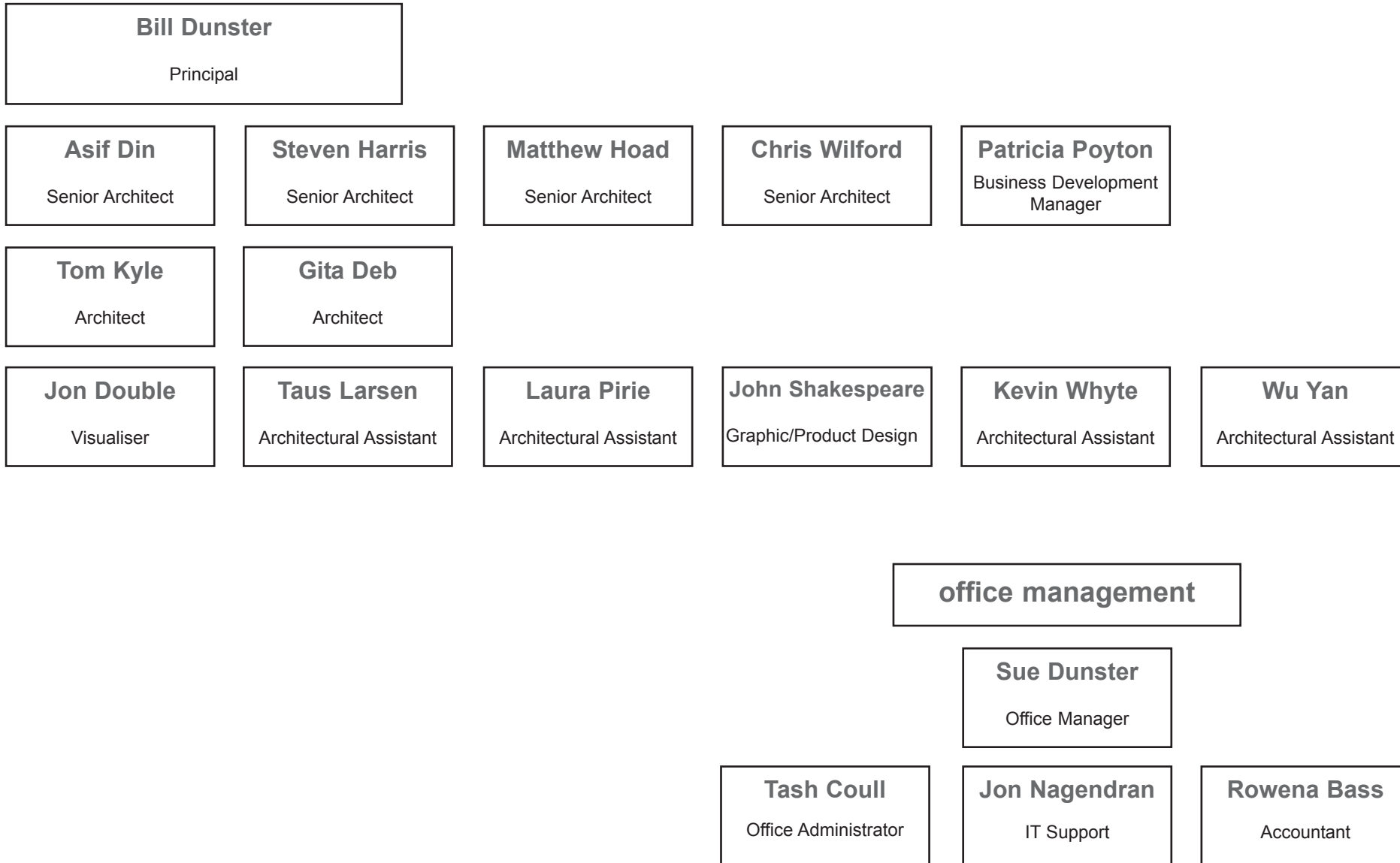
Matt Hoad

BA Hons DipArch AIWSc RIBA

Matthew studied at Kingston University and the Royal Academy of Fine Arts in Copenhagen and has subsequently worked extensively on environmental based projects since qualifying. Matthew has lectured at Kingston University and written journal articles on sustainability and timber construction.

Prior to joining ZEDfactory in May 2004, Matthew worked for architects Michael Hopkins and Partners for 5 years from 1997 and for specialist timber framers, the Green Oak Carpentry Company from 2002 to 2004. This has brought design and contracting expertise to Bill Dunster Architects where the development of buildings is closely carried out with manufacturers and specialists to deliver innovative architecture.

Organisational Structure



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