



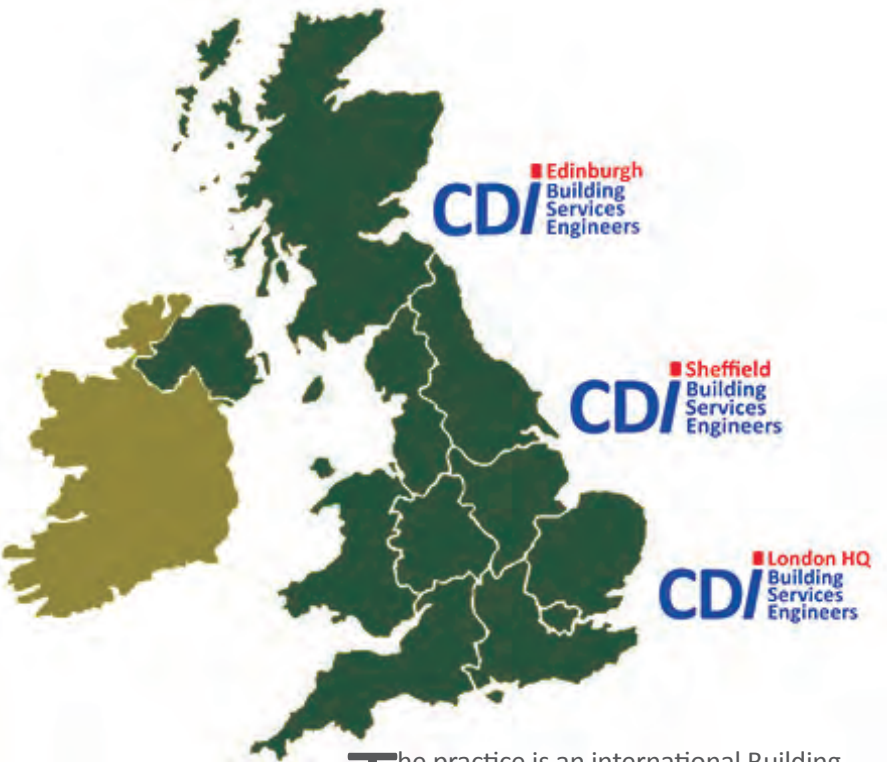
Residential Sector Projects

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About CD International /



The practice is an international Building Services Consulting Engineers having completed award winning projects throughout Europe with construction values up to £300 million.

Location

The company has offices in London, Edinburgh and Sheffield with associate partners throughout Central and Eastern Europe, Central Asia and the U.S.

Sectors

Market strategy has been committed to developing consultancy appointments throughout all areas of the commercial sector including:

- Mixed-use & Retail
- Leisure and entertainment
- Office & tech hubs
- Hotel & Resorts
- Residential
- Listed & Heritage

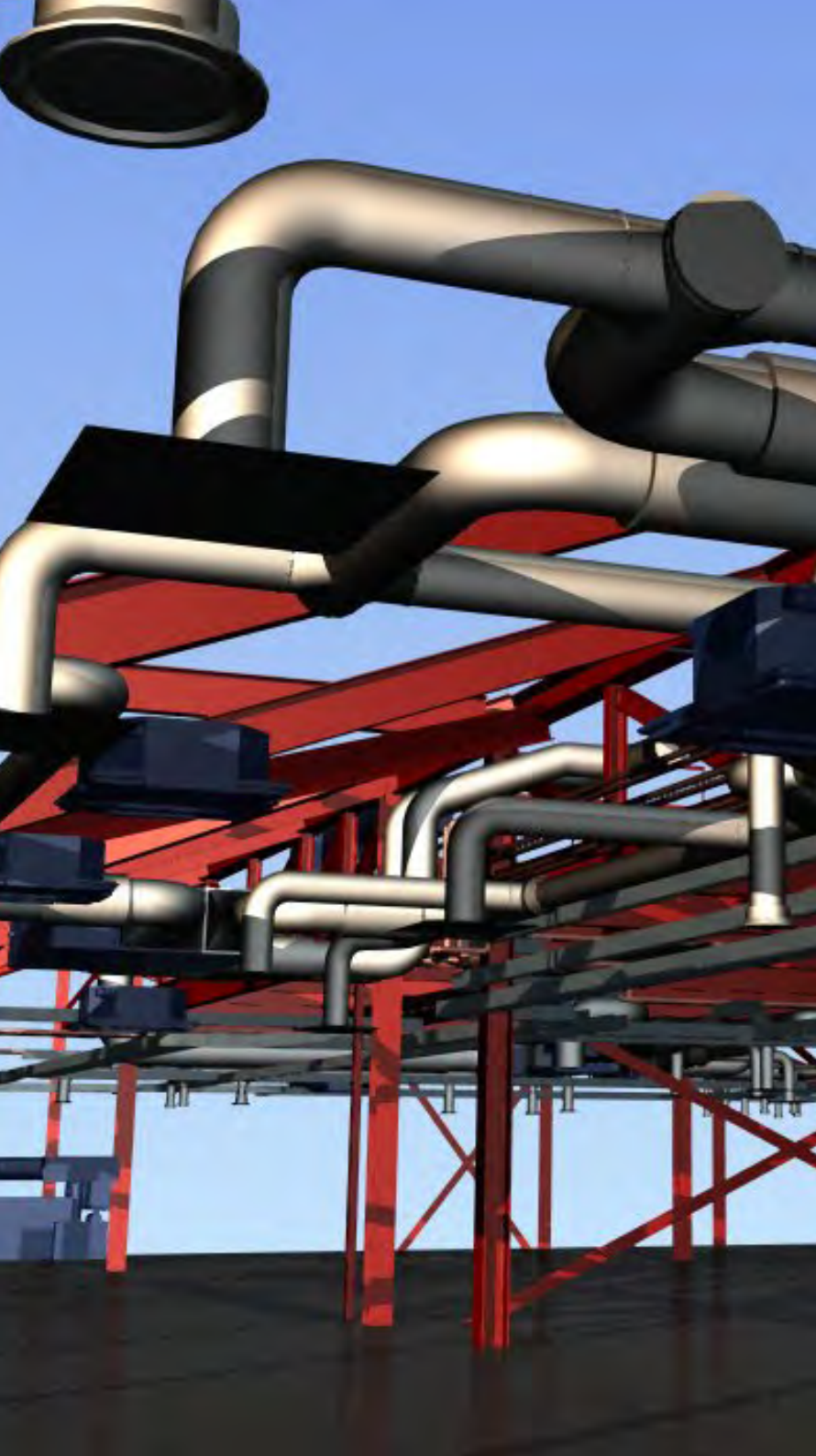
The business strategy is also focused on a European and worldwide operation with a number of major projects successfully completed in continental Europe, Africa and the Middle East.

Working with lead architects and local partners on international schemes, we developed unique experience and ability to combine knowledge from various practices and implement it into the real project.

Services

The company offers a full range of professional services which can be individually tailored to meet specific client needs as follows:

- Mechanical Design
- Electrical Design
- Public Health Design
- Fire Protection and Life Safety
- Vertical Transportation
- Infrastructure
- Low energy design
- IT communication
- Low Carbon Energy assessment
- BREEAM assessments
- Thermal Modelling
- Energy audits and energy appraisals



Technology & BIM /

We have been using IESVE for Engineers modeling Software, SketchUP Pro and Revit® Architecture and MEP for most of the projects in the UK and abroad. This allows us to design comfortable buildings that consume significantly less energy and incorporate low-carbon and renewable technologies.

IESVE© for Engineers

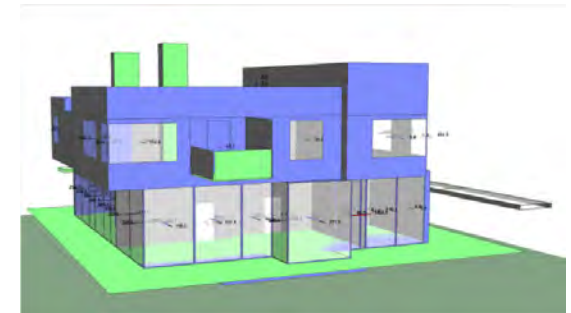
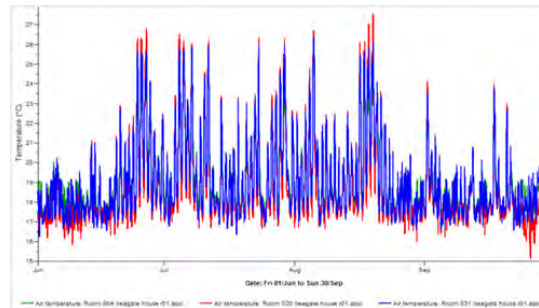
is a cutting-edge suite of building performance simulation tools. Used by leading sustainable design experts across the globe, it creates understanding of the performance impacts of different low-energy design strategies.

Autodesk Revit ©

REVIT© allow multiple disciplines work together on the same project. With REVIT© we can perform collision checking, which detects if different components of the building are occupying the same physical space.

SketchUP

SketchUP allow us to draw and present the project in 3D format, analyse best location and dimensions for Brise Soleil and has many other useful applications.



Sustainability and Planning /



We are committed to measuring the low energy design aspects for all our projects and believe this will become an ever increasingly important factor in the design process.

Sustainability

We are committed to developing sustainable projects utilising low energy solutions. We have a building technology team specialising in the field of sustainable/green building design. The company is a member of the, BREEAM register, BSRIA and CIBSE.

Our aim is to incorporate low energy solutions which offer the Client a realistic return on the investment. We have a dedicated internal team to offer comprehensive service on all aspects of low energy design including:

- Energy Surveys
- Thermal Modelling (IES software)
- Building Regulations Part L (SBEM) compliance calculations and EPC
- Renewable Energy Reports
- BREEAM , CODE for Sustainable Homes

Sustainable energy strategy

Our reports explore available low energy and renewable options and propose the Sustainable Energy Strategy. Energy efficient technologies, decentralised energy systems and renewable energy technologies are being considered to comply with the London Boroughs Development Plans and the Sustainable Design and Construction Documents (SPD).

London Plan Policies

The following policies has been assessed as set out in the London Plan 2011, Chapter 5 London's Response to Climate Change, and follows the hierarchy of using less energy, supplying energy efficiently and using renewable energy:

- Policy 5.2 Minimising Carbon Emissions - Sustainable Energy Efficiency (LEAN)
- Policy 5.5 Decentralised Energy Networks
- Policy 5.6 Decentralised Energy in Development Proposals (CLEAN)
- Policy 5.7 Renewable Energy (GREEN)

The London Plan Policy 5.2 & 5.5 & 5.7 Renewable Energy & Decentralised Energy Networks highlights the following approaches which should be considered in developing the sustainable energy strategy:

- Renewable Energy;
- Hierarchical carbon dioxide emission reduction;
- Decentralised Energy;
- Connection to Decentralised Energy Network.

Residential / UK

Woolwich/ Mast Quay Phases 1&2



▲ The development achieved a score of 70.3, which meets the required Eco Homes rating of "Excellent"

CD International have been appointed to undertake the Public Health and Electrical services design at the Mast Quay residential development in Woolwich. The development consists of two number fourteen storey towers of high specification apartments coupled with a three storey affordable housing block. Mixed use" development of 218 no. 1, 2 & 3 bed Penthouse residential units along with approximately 730 sqm of commercial space.

Phase 2

- Block 'D' Tower of Ground/Deck + 14 Storeys with commercial at Deck Level and residential over.
- Block 'E' Tower of Ground/Deck + 22 Storeys of residential with stepping tail of deck + 10 storeys with commercial @ deck level with residential over.
- Both Blocks are accessed from a podium deck which comprises of a public square with access to the lower river level and riverwalk. Secure car parking is to be located underneath the deck at ground level. ➡

*Design: Nigel Upchurch Associates
Services Design: CD International BSE*



Sustainability

The Mast Quay Phase 2 falls under the Greater London Authority's (GLA) Initiative for renewable energy and as such we must prove that renewable energy has been considered from the earliest design stage with a realistic strategy set out for the technology's inclusion and integration to the building fabric.

To achieve the required percentage reduction in carbon emissions it would be possible to install a ground source heat pump to provide heating for a part of the development.

The technology also provides an innovative, flexible and low maintenance solution for the landlord with only cost implications being the capital investment required for this installation.

Compared to the other suitable technologies the ground loop offers the most cost effective method of complying with the GLA's requirements and its inclusion only represents a cost increase of approximately 0.2%.





*Client: Golden House, Uzbekistan
Architect: Chapman Taylor, UK
Structural: Tashgiprogor, Uzbekistan
Lighting: Scotts Lighting, Germany
MEP Design: CD International BSE, UK*

Residential / Uzbekistan

Tashkent / Mirabad Avenue

Mirabad Residential project is a unique opportunity for a new type of residential development in the city of Tashkent and will initiate regeneration of the area and create a new urban quarter.

Context

We are proud to be one of a few international teams that are currently working in Uzbekistan. Beautiful country with the ancient history has been gradually opening up to the world and welcomes new approach and technologies to create new their living built environment.

The design team lead by Chapman Taylor Partners (CTP) with local planning institute advising on specific of planning and regulations. The competent design team with international experience

is to ensure that local culture and traditions are embedded into the planning and design of the residential quarters.

There will be around 2000 mid and high- end apartments delivered in two phases, spread across four blocks with massive green courtyards in each block, underground parking and green roofs. First two floors of each building are allocated for commercial spaces, like shops, small offices, restaurant and amenities, including gym, nursery and services for the local residents.



Energy Strategy

Prior to the start of MEP design we developed and agreed with the Client a Sustainability Energy Strategy (SES). In order to realise the Strategy it was important to understand the drivers for change and to define a long-term vision for the scheme. Uzbekistan's Government initiated a number of important steps to support development of their energy sector, as the current energy infrastructure is overloaded and in-efficient with reported significant losses.

We proposed a Communal Central Energy Strategy, where heating and cooling network can deliver both the necessary capacity to meet current demand, significantly contribute to CO₂ emissions reduction and provide a robust framework to address future demand growth and variation between heating, cooling and electricity. Future proof the scheme is vital in terms of maximum capacity and capacity phasing, as is adopting emerging low carbon technologies as they become commercially viable.

Heating and cooling

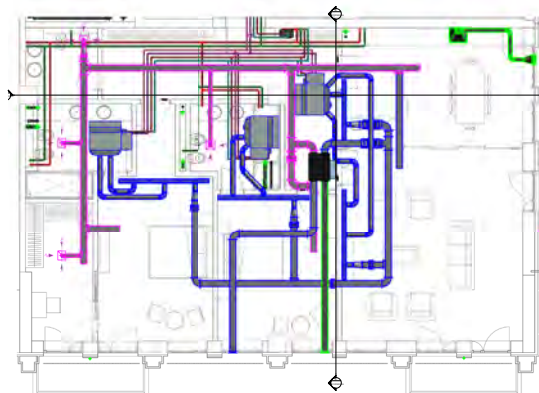
Tashkent is famous for its long hot summers and very mild winters, so the efficient cooling and air conditioning is essential. High standard of insulation also required to minimise heat losses.

Traditionally, residents would install the A/C units themselves, mounting an external block on the façade of the building. Unfortunately, there are a lot of examples, where such uncontrolled installations completely ruined the look of the building. One of the solutions implemented by our Client previously for de-centralised air conditioning was to install place holders for units, which form a part of façade decorations in traditional patterns. This allows to transfer the capi-



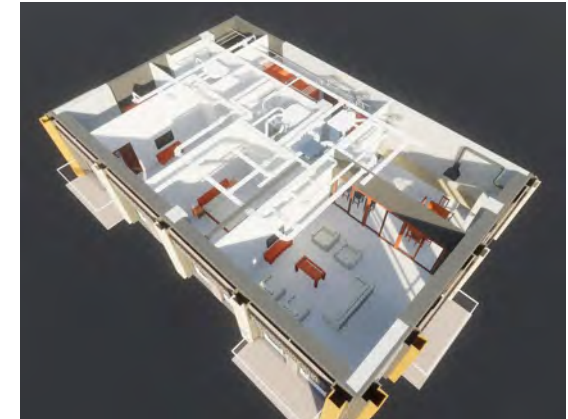
tal, running and maintenance cost of A/C to the residents, but does not allow the owner of the development to control energy spent on cooling or heating or benefit from heat recovery or efficiency of central chillers.

We proposed to install central heating and cooling, where each apartment unit is provided with cooling connections from the central system distribution of chilled water. Chiller will utilise environmentally friendly refrigerants and heat will be rejected via air cooled tower condensers. Heating is generated by highly efficient gas fired condensing boilers.



Ventilation

For ventilation, residential apartments using air handling units with heat recovery. Special requirements were placed for kitchen extracts. Firstly, by the existing building codes of the country, secondly, by the nature of the traditional cuisine of Uzbekistan that proved to be very spicy, aromatic and oil rich. Short length of extract to a façade was a traditional option, however this may create unwanted smell drifting along the elevation and reaching intake points.



Option with central kitchen extract duct to the roof could undermine the flexibility principles, and but was chosen after weighting all options.

Building management system

Whole complex will be managed by one company and BMS systems will be installed to enable simple, efficient control and monitoring of all required functions, including HVAC systems with energy monitoring including all metering for the apartments and retail, fire and security systems etc. This is relatively new application in Uzbekistan and would need to be installed and operated based on soft landing principles.



*Developer: Media Office
Services Design: CD International BSE, London*

Residential/ UK

London, Soho / Marshall Street

The regeneration of Marshall Street Baths commenced approximately in 2008, partly as a commercial and partly as a residential development.

Project outline

CD International provide building services design, including Sustainability report for planning applications and Code for Sustainable Home assessment for 12 new apartments.

Achieving Code Level 3 for all flats was the planning requirement. These flats are now built, handed over and have been occupied since December 2010. Since then, a part of the commercial area is being converted into three additional penthouse flats.





*Client: The Investment Room
MEP: CD International*

Listed / Residential/ UK

Yorkshire/ Hallmark House Redevelopment

Regeneration of the iconic Grade II-listed Hallmark House site on Bingley Road in Heaton to residential-led development.

Project outline

The Investment Room, Barnsley-based developer will sympathetically convert the existing buildings into 145 homes and create 240 apartments within the grounds of the former card factory.

The development will use the original W N Sharpe name in a nod to its name when it was first built. During the 1930s, W N Sharpe of Bradford built Hallmark House as the headquarters for its successful printing business.

Technical Outline

CDI was appointed to provide the design services for incoming utilities, performance specification, SAP calculations. Due to rapid de-carbonisation of grid electricity and in lieu of government programme to reduce the dependency on natural gas, the heating and hot water has been provided with electricity via panel radiators and hot water heaters.



*Architect: Upchurch Associates
Services Design: CD International BSE, London*

Residential/ UK

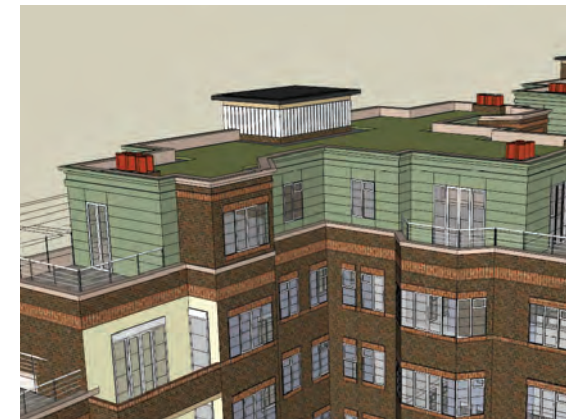
Chiswick Village / Rooftop Apartments

Development of 15 luxury penthouses on the top of the Chiswick Village Mansions together with improvement of common areas.

Project outline

CD International prepared sustainability and renewable energy studies for planning application. We have proposed whole house ventilation with heat recovery, air-sources heat pumps and micro-CHP units.

Part of the overall sustainability strategy for the development has been the inclusion of green roofs and accommodation of 15sqm solar panels per penthouse.





*Architect: Upchurch Associates
Services Design: CD International BSE, London*

Residential/ UK

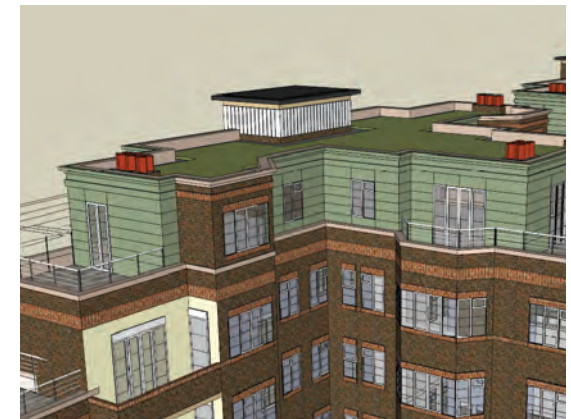
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Investor: Aitch Group
Architect: Stock Woolstencroft Architects
Services Design: CD International BSE, London

Mixed Use / UK

Rainham / New Road

This is an eight acre site in the heart of the 'London Riverside' Regeneration Area, that is being transformed into a flagship location for sustainable urban living with a new transport exchange, public squares and high quality open space. Project comprises of 519 residential units + 20,000 sq ft commercial space.

Project outline

CD International propose to deliver a high standard residential development with a high standard of sustainable construction to achieve a BREEAM rating of "Very Good" and at the very minimum achieving a Level 3 Code for Sustainable Homes and working towards Level 4.

Our engineers explore available low energy and renewable options and proposes the sustainable energy strategy for the proposed development.

Energy efficient technologies, decentralised energy systems and renewable energy technologies have been considered to comply with the local London Borough of Havering Planning Policies (policies 3.4 and 3.5) and the Sustainable Design and Construction Documents (SPD) together with policies stated in the London Plan:

- Policy 4A.3 Sustainable Energy Efficiency
 - Policy 4A.4 Energy Assessment
 - Policy 4A.5 Provision for Heating Networks
 - Policy 4A.6 CHP and Decentralised Energy
- The current London Plan identifies the need for resilience and security of supply with the current infrastructure provision. The proposed Energy Centre goes some way to addressing this point with the inclusion of Combined Heat & Power Plant, developing heating and electricity independently and efficiently.

The integration of each technology has been assessed, addressing key architectural and planning issues such as structural, sight and noise implications.



*Architect: Upchurch Associates
Services Design: CD International BSE, London*

Mixed Use / UK

London / New Kent Road

The erection of a part 3, part 4 and part 5 storey mixed use development comprising basement storage, commercial floor space at ground floor level and apartments at first to fourth floor together with associated amenity space. Ancillary commercial space provided at basement level.

Project outline

CD International was responsible for Sustainability Report for Planning application, which was granted by Southwark Council.

The proposed development at New Kent Road has achieved the balance of delivering a building which is of architectural merit, sensitive to the surrounding context and incorporates the sustainability ethos whilst ensuring a commercially driven solution.

The building has been orientated to minimise the effect of south facing solar gain.

The building has incorporated all the good practice energy efficient techniques such as heat recovery, low compact fluorescent lighting, variable speed drives, condensing boilers, energy management control systems.

The building envelope has an improved thermal performance and air permeability. This has been supplemented by the use of LED lighting technology in the public areas and high efficiency glazing in the external façade.

The building has incorporated a Combined Heat and Power unit, and to maximise the waste heat.

The renewable energy has been provided by solar collectors. The solar collectors will also provide a solar buffer zone to reduce solar gain for the roof of the 4 storey building.

Water conservation has included a number of measures and rainwater harvesting collector is used to serve the commercial toilets.



Client: Private
MEP: CD International

Residential / UK

London / Boydell Court

Two extra floors and a roof terrace were built on top of the existing eight storey residential block, located in one of the London's boroughs.

Project outline

The proposals are to build another 2 floors and a roof terrace on top of the existing 8th floor roof and fit out 6 luxury duplex apartments fully air conditioned and with under floor heating and cooling to all areas. Also refurbishment of 2 passenger lifts and 2 service lifts.

These prestigious apartments are comfort conditioned predominantly by underfloor heating and cooling systems with bedrooms served by four-pipe fan coil systems. Each apartment is me-

chanically ventilated by central fresh air supply and extract plant. This approach results in a high quality living environment and least intrusion to the minimalist interior design theme, whilst also optimising the potential for energy reduction.

Each apartment is also provided with the latest technology in intelligent controls systems for the lighting, audio visual and environmental controls systems, fully integrated with a dedicated user interface device. Particular attention has been paid to achieving low background noise levels and the selection of high quality 'visible' components in keeping with the interior design. Landlord's infrastructure services were also designed with careful phasing necessary to ensure no interruption to occupied apartments.

Systems designed and installed

- Underfloor heating and cooling systems.
- Heating system served by condensing boilers
- Fresh air supply and extract systems
- Integrated controls system providing seamless user interface
- AV systems



Developer: Loncor Homes Ltd

Architect: Twenty First Architecture Ltd

Services Design: CD International BSE, London

Mixed use/ UK

London / Baylis Road

The project consist of demolition of the existing building and the erection of 4 and 7 storey linked buildings with mixed development comprising of commercial and residential units with associated amenity space and car parking. A BREEAM Pre Assessment has been carried out for the retail and office space and early indications predict that each space will achieve a very good rating.

Project outline

The proposed development at Baylis Road Lambeth London has achieved the balance of delivering a building which is of architectural merit, sensitive to the surrounding context and incorporates the sustainability ethos whilst ensuring a viable solution.

The sustainability approach follows the guidelines of the Lambeth Council's Planning Policies (Environmental Issues Best Practice) and the Sustainable Design and Construction Documents (SPD).

The building has incorporated all the good practice energy efficient techniques such as heat recovery, low compact fluorescent lighting, variable speed drives, condensing boilers, energy management control systems.

The building envelope has an improved thermal performance. This has been supplemented by the use of LED lighting technology in the public areas and high efficiency glazing in the external façade.

The building has incorporated a green roof to assist in reducing solar gains and also attenuating the peak storm water flow rate from the area of roof.

The building has incorporated a Combined Heat and Power unit, and to maximise the waste heat.

The renewable energy has been provided by solar collectors. The solar collectors will also provide a solar buffer zone to reduce solar gain for the roof of the ground floor plus 6-storey building.

Water conservation measure and rainwater harvesting collector is used to serve the commercial toilets.



Client: Private
Architect: PM/QS: Lavingtons
Services Design: CD International BSE, London

Residential/ UK

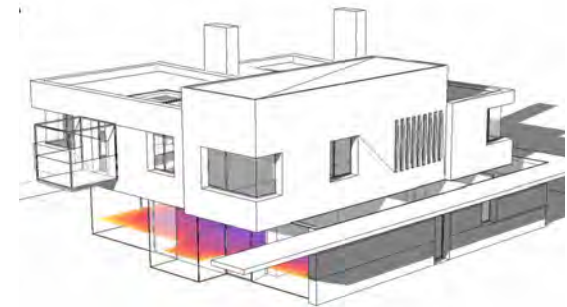
Bramley / Lea Gate House

CDI has provided initial Concept Design, thermal modelling, and site supervision during construction stage for a new 3 storey private house completed with a new barn and outdoor swimming pool.

Project outline

The environmental design has been developed to reduce the carbon footprint, lower running costs, aiming for a Code 6 house – a zero carbon emission building.

The flat roof over the first floor block was dedicated to solar panels to capture solar energy for heating. A number of skylights have also been positioned on the roof mainly to bring natural light to the core of the building on the ground and first floor.





The building envelope is to be airtight to minimise the amount of warm or cool air that can pass through the structure, background ventilation is provided instead by a zoned mechanical ventilation system to recover the heat before discharging the air externally.

The flat roof over the first floor block was dedicated to solar panels to capture solar energy for heating. A number of skylights have also been positioned on the roof mainly to bring natural light to the core of the building on the ground and first floor.

- The first floor has been design to overhand the the ground floor windows to reduce solar gains.
- Off-setting basement level slab allow in relation to ground fload layout allows us to bring air duct for fresh air.
- Back ground ventilation is provided instead by a zoned mechanical ventilation system to recover the heat before discharging the air externally.
- Air source heat pump and undefloor heating were inplemented throughtout the house.
- Specialty designed roof ventilation outlets at high level provided greater stack effect for natural ventilation.
- The building envelope is airtight to minimise the amount of warm or cool air that can pass through the structure.
- Thermal insulation has been improved from the required base levels and concrete structure design to reduce solar gains.
- Facilities have been provided to install Solar Thermal and PV on the roof.

Work in progress: Ventilation outlets and under floor heating installation



*Client: Q Development
Architect: Terry Pawson Architects
Structural Engineer: Elliott Wood Partnership
Services Design: CD International BSE, London*

Residential/ UK

Kingston-upon-Thames / Twin Houses

CD International was appointed as M&E Consultancy to offer full services in connection with the design, specification and procurement of M&E services for the project.

Project outline

Two stone clad family houses are located on a quiet suburban road on the outskirts of London. Each house is arranged over three floors and organised around a central courtyard that connects through to the main garden and brings daylight into the basement level

The 600 sqm houses are designed to symmetrically reflect one another and are slightly staggered on the gradient of the site. Internally, rooms are positioned around a central courtyard which brings light to the lower ground floor.

The ground floor is devoted to family life and entertainment; private bedrooms are located on the first floor and guest bedrooms in the lower ground floor facing into the courtyard



"The houses possess a balance and coherence that creates a serene contact between them and the land. The suggested materials and colours belong entirely to the scheme. This is an absolutely first class design. It has been very well thought through, and created with skill and courage. This elegant, staggered pair of buildings sits comfortably within the mature landscape, creating a very positive aesthetic."

Excerpt from Design Review Panel report



Client: Private
Architects: ADAM Architecture
MEP: CD International BSE

Luxury residential/ UK

Berkshire / Bear Ash Residence

A luxury residential property Bear Ash House, located on the attractive site, set on the edge of hamlet Hare Hatch in Berkshire. The house of around 700sqm sets on two storeys, basement and attic, and occupies an elevated position with south view over garden and parkland.

Project outline

Phase One included walled garden and shed for garden equipment and swimming pool.

Phase two included design of actual house, which will consist of:

- Air-conditioned basement with playroom, TV lounge, gym and cellar and technical rooms for engineering equipment.
- Ground Floor: Portico entrance leading to the Dining hall and through to Drawing room.

Floor also accommodates Study, Library and kitchen.

- First floor contains bedrooms for the whole family.
- Attic floor used for observatory green house and storage.

CD International has been appointed to undertake Initial Concept Design of MEP services with Feasibility Studies with further progress to Detailed design and Construction Supervision.



*Architect: Home Revolution
Services Design: CD International BSE, London*

Residential / UK

Wollaston / The Dovecote House

This unique site development concept and house design will make maximum use of natural and renewable energy resources, demonstrating considerable empathy with its surroundings and the landscape, and harnessing the elements to produce a house that is, in energy terms, more than self-sufficient.

Building description

The proposal provides full integration of the house and the renewable energy installations, and is not therefore just for a house, but for a sustainable site development, with a low energy dwelling and integrated renewable energy systems.

Unusually, this project can be regarded as a mini renewable power station, capturing and managing sufficient solar PV electrical energy to also power the adjacent dwellings.

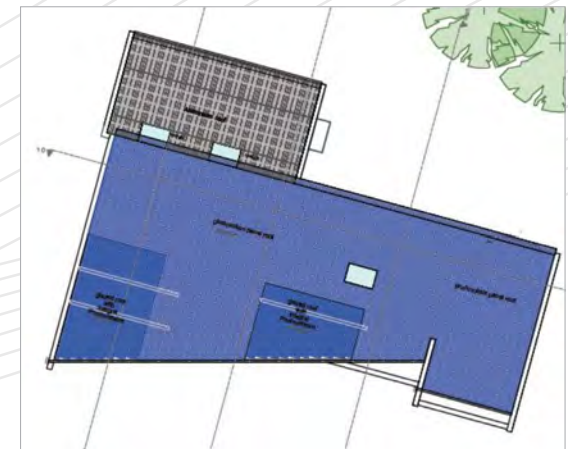
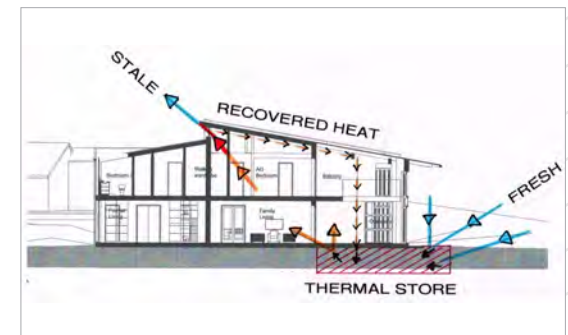
Project description

A fabric first approach to reducing Carbon emissions was considered first, which provides the most cost effective and robust operational solution. A relatively poor performing fabric with large sized renewables technology being installed, was not considered as good practice.



The following technologies were installed in order to make building energy and resource efficient.

- Air Sourced Heat pumps
- Photovoltaic panels (35kW) and solar thermal
- Natural ventilation and Mechanical Ventilation with Heat Recovery





Architect: Home Revolution

Services Design: CD International BSE, London

Residential / UK

Wellingborough / The Craves

Unique site development concept and house design will make maximum use of natural and renewable energy resources, demonstrating considerable empathy with its surroundings and the landscape, and harnessing the elements to produce a house that is, in energy terms, more than self-sufficient.

Building description

A house providing about 450 square metres living accommodation over two floors, with a lower ground floor basement incorporating garage, plant and machinery rooms of about 128 square metres.

CD International has completed feasibility study, concept design, formulated M&E cost plan and Tender specifications and reviewed all received tendered replies.

Project description

The development required to comply with Planning Policy Statement 7: Sustainable Development in Rural Areas; Code for Sustainable homes level 6 – net zero carbon and SAP 2009.

A fabric first approach to reducing Carbon emissions was considered first, which provides the most cost effective and robust operational solution.



The house is contemporary and embraces energy efficiency throughout. With heating and cooling largely provided by air, large diameter ducts will be used to reduce air velocity and therefore result in virtually silent operation. Large access passages for these ducts and services are incorporated into the build at all levels, allowing easy installation of all services, ventilation, heating and cooling systems, and to allow updating as required in the future.

The following technologies were installed in order to make building energy and resource efficient.

- High standards of insulation were used where appropriate.
- Air Sourced Heat pumps and Earth Tube, an underground heat exchanger that can capture heat from and/or dissipate heat to the ground.
- Photovoltaic panels and solar thermal
- Natural ventilation and Mechanical Ventilation with Heat Recovery
- Water saving measures include using the lake water to feed potable cold water to the house
- Green Roof
- Solar shading





Client: Private

MEP: CD International

Luxury residential/ UK

Buckinghamshire/ Holmewood House

Holme Wood House is a private luxury development located in Marlow, Buckinghamshire.

Project outline

The project is a bespoke house, which comprise a single storey development with a 5m high-domed grass roof. A swimming pool is located within the centre of the house and the property is divided between 4 master bedrooms with en-suite facilities, a living room, dining room and study form the main living quarters.

The Client has a comprehensive fine arts collection which shall be displayed throughout the property with an Art Gallery vein.

Technical Overview

Site wide irrigation system with bore hole supply; All air central ventilation system with zoned reheats; 'Smart house' technology for lighting and climate control; Full heat reclaim pool hall ventilation system.

Due to the Client's sensitivity to noise, a full acoustic appraisal of the services scheme was implemented in the form of door and window contact disabling the chiller and all ventilation services were designed with a low velocity.

