DEVELOPMENT CONTROL AGENDA

THURSDAY 7 APRIL 2016 AT 7.00 PM
COUNCIL CHAMBER

The Councillors listed below are requested to attend the above meeting, on the day and at the time and place stated, to consider the business set out in this agenda.

Membership

Councillor D Collins (Chairman)
Councillor Guest (Vice-Chairman)
Councillor Birnie
Councillor Clark
Councillor Conway
Councillor Maddern
Councillor Matthews
Councillor Riddick
Councillor Ritchie
Councillor R Sutton
Councillor Whitman
Councillor C Wyatt-Lowe
Councillor Fisher
Councillor Tindall

For further information, please contact Katie Mogan or Member Support

AGENDA

10. THE BEACON - SUSTAINABILITY STATEMENT (Pages 2 - 12)

CORONA PROPERTIES

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The Beacon- Symbio Place –Reference 4/03441/15/MFA

Sustainable Features

1) *Highest Thermal and Sound Insulation.*

The Beacon is to be constructed with reinforced concrete (RC). Uniquely, the party walls between apartments are of RC construction. Add to this construction is the use of up to 200mm Rockwool panel insulation and the Beacon will have thermal emissivity U value of 0.15W/m2K or 75% better than current building regulations. This means the building stays warmer in the winter for longer and cooler in the summer for longer without requiring heating for cooling artificially. The insulation and construction method chosen reduces sound ingress significantly and as such the apartments have an internal acoustic rating of less than -15db. This is "whisper" quiet. The technology is not new and not expensive, begging the question why other developers do not do this as standard.

2) *Windows*

The windows were initially due to be triple glazed but will now be quadruple glazed offering thermal emissivity u value of 0.1W/M2K. This is 95% better than current double glazing in terms of sound and heat insulation. The cost of quadruple glazing is not prohibitive as a lot of the cost in in the frame and installation. This means the building stays warmer in the winter for longer and cooler in the summer for longer without requiring heating for cooling artificially. The glazing also reduces sound noise from the street and adjoining flats. Triple and Quadruple glazing is routinely used in Europe.

3) *Underfloor Heating and Cooling*

The Beacon will utilize underfloor heating and cooling. Underfloor heating is commonly used in the UK for new buildings. Hot or cold water is run through pipes in the floor to heat or cool a particular room. This is at least 40% more efficient than conventional radiator heating. The heat taken from cooling is recovered and put into the hot water system thus being

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even more sustainable. The underfloor heating is covered with a sound impact insulator called Pliteq and as such there is minimal sound transmissions from the floors and ceilings.

4) *LED Lighting*

The Beacon will only use LED lights. Lighting contributes to upto 40% of a building's energy use (source Carbon Trust). Combined with the use of PIR /Daylight sensors, the use of energy attributed to lighting in The Beacon will be 80% below a standard building. LED lights and PIR/Daylight sensors are common place technology but not utilized in buildings by many developers for no logical reason. The technology is established and commonly used.

5) *Mechanical Ventilation Heat Recovery*

The apartments will utilize Mechanical Ventilation Heat Recovery Units (MHVR). Under new building regulations, air tightness reduces heat loss. Free air is brought into an apartment via ventilation units. The MHVR recovery heat from warm air inside the apartment before pumping it out and bringing in potentially colder air from outside. MHVR's are 80% more efficient that standard ventilation units. Uniquely in The Beacon, in addition to a sprinkler system in each apartment, we will use MHVR units which can also remove smoke or fumes generated by a fire. Most people killed or injured by fires are affected by the smoke and fumes and having smoke extraction in each and every flat as standard will make The Beacon one of the safest buildings in the UK in terms of fire safety.

6) *Photovoltaic Solar Panels*

Photovoltaic solar panels (PV), generate electricity by converting sun light into electricity. The solar panels face the sun and do not reflect light onto the ground. The best place for PV panels in terms of creating the most electricity from sunlight is south. The Beacon has PV panels on every face on each floor on ledges where they are hidden from sight from the street level view. Although having PV panels in other directions other than south affects the efficiency, even north facing panels generate electricity. The Beacon will have a 760KW PV array generating enough electricity for all

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the lighting, heat pumps and car parking. There will be excess production of electricity in the winter which will be exported to the electricity grid and a deficit in the winter which will be made up from the grid. Overall the PV panels will generate all the electricity required by the building. Solar panels have been used in the UK and the world for over 50 years and they are not new technology. They have simply become more affordable.

Please find below the Case Studies where there are Large Scale Solar PV Installations.

7) *Hydro generator*

The Beacon is the first building in the world to use a low head hydro generator when water collected from rainfall enters the grey water collection tank. It will also use in pipe hydrogenation pumps which will generate electricity every time water enters the building from the water mains. These solutions will contribute an additional 5% to the electricity generated by the building. Hydro generators have been used for over a century. The generators are common place but placing them in a tall tower to generate electricity has not been done before but is very easy to achieve.

8) *Ground Source Heat Pumps and Geothermal*

Ground Source Heat Pumps and Geothermal low carbon technologies have been used for over 15 years in the UK. Ground source is commonly used but required a large area upon which to lay out the water pipes and bury them just 10m below ground. At 10m, the ground in around 10 degrees Celsius and the heat pumps extract some of that heat. Where a large surface area is not available or more heat is required, the pipes are dug deeper into the ground. The ground increases in temperature, the deeper you go. At 200m, the ground is about 18 degrees Celsius. At 500m it is about 24 degrees Celsius and at 1000m, it is up to 38 degrees Celsius. Fracking companies in the UK and the world routinely dig upto 10,000m or 10Km so the proposed depth is relatively shallow technically speaking. There are numerous examples of building that use geothermal energy in Europe and particularly Switzerland. In Zug, Switzerland, 35 houses run of 4 geothermal boreholes at 500m, a school and numerous office buildings. The Swiss geothermal housing development has been successfully been running for almost 25 years. The Eden project in the UK uses deep

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geothermal energy. The technology is established by the costs have recently come down dramatically, driven in part by drilling advances due to the fracking industry.

Please find below the Case Studies in regards to Ground Source Heat Pumps

9) *Automatic Parking System.*

An automatic parking system, is a parking system that robotically parks your car for you. You enter a garage, leave your car, take your belongs and once you leave the car is parked in a stacking system below ground. Unlike a multi-storey car park convential car park system (CPS), there are no people in the car park, so there is no risk of theft, or criminality in terms of personal injury or muggings, no vandalism and the car is protected from the elements. The car is retrieved within 60 seconds by a remote fob or a key code.

Automatic car parking systems, do not require forced mechanical air ventilation or constant lighting. They are safer in that no person get hurt by reversing cars or similar accidents as there are no people in the system and the cars are retrieved at ground level. Cars in a conventional car parking system idle their engines while looking or waiting for a space. This creates emissions that kill. Overall if you consider the fuel savings from looking for a car space, idling, reversing, lighting, heating and ventilation, an APS is at least 60% more sustainable than a CPS.

Please find below the Case Studies where developers have used APS

CASE STUDIES – LARGE SCALE SOLAR PV PROJECTS

Qatar National Convention Centre (Qatar)

A 667 kW solar power project installed to the roof of the Qatar National Convention Center. This project was the largest solar photovoltaic power system in Qatar to date. Enviromena partnered with Doha-based renewable energy company GreenGulf to deliver the system, which was constructed with solar modules supplied by SolarWorld. The solar power system has been operational since December 2011 and produces 1,225 MWh of electricity per year. This provides 12.5% of the building's total power needs, offsetting 1,140 tons of carbon emissions per year, and

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contributing to the building's gold certification under the LEED green building program.

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http://enviromena.com/profiles/qatar-national-convention-centre/

CIS Tower Solar Skyscraper Retrofit (Manchester, UK)

Built in 1962 in Manchester(UK) to host the British insurance company CIS Ltd. headquarters, the CIS Tower was suffering the from its 40 years exposure to pollution. The building, that was the highest in Europe when it was built and still is the second highest in Manchester, had millions of little mosaic tiles covering its windowless façade, but due to time and pollution, these tiles were falling off. After spending £5.5 million (around $ 11 million), three faces of the building were clad with a total of 7,244 Sharp photovoltaic panels generating 390kW of energy – or 181,000 units of renewable electricity each year - equivalent to the energy needed to full power 55 homes for a year. Only 4,898 of the modules are actually functional, but they still soak up enough sunlight to generate 390-kilowatts of energy, or enough juice to "power 1,000 PCs for a year." The PVS began feeding electricity to the National Grid in November 2005. This green building also has 24 wind turbines on the roof, which provide 10 percent of the total power used by the building.

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The CIS tower in Manchester has three of its four sides completely clad in photovoltaic cells. This allows the building to harvest the sun's power throughout the day from dawn to dusk. The front wall is facing south, which is the main recipient of sunlight. The east and west walls would receive far less light. As this structure is in the Northern Hemisphere, there is clearly no point cladding the north wall with solar panels. This building is a perfect example of mega-scale use of solar panels. Even though the east and west walls are clearly not as productive as the south wall they were paneled anyway. Cooperative Insurance Society (CIS) invested over four million pounds of non-government funds into this project. That's the equivalent of $USD 8.04 million or $AU 9.36 million, and it was the largest renewable energy project in the UK.

The tower's 7,244 solar panels produce sufficient energy per annum on average to power a three bedroom house for 60 years. While the panels produce only 21kW of electricity (= 0.021 MW), CIS has used this office building to make a public commitment to build a sustainable future. Even though the solar panels only meet 10% of the building's power needs, and will probably never pay for themselves, CIS has done as much as they could to make this one of the greenest office buildings in the United Kingdom. This project also serves as a counter argument to the often aired idea that Solar Power is not a viable mainstream energy supply because of the amount of space required. This building is meeting 10% of its energy needs with no additional space requirements for the panels. This same approach can be taken to rooftops, correctly facing walls, carpark covers, bus shelters, the list is endless. All we need to do is stand on top of a hill in any urban area and we can see thousands of acres of free roof and wall space which can be treated in the same manner as the CIS Tower. The renewable energy they generate saves the equivalent of 100 tons of CO2 emissions. The CIS Tower project is one of the biggest solar installations in the UK and demonstrates how new PV technology can be easily incorporated into building practice. The renewable energy they generate saves the equivalent of 100 tons of CO2 emissions. The CIS Tower project is one of the biggest solar installations in the UK and demonstrates how new PV technology can be easily incorporated into building practice.

http://www.solaripedia.com/13/117/cis_tower_solar_skyscraper_retrofit_(manchester,_uk).html

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CASE STUDIES – GROUND SOURCE HEAT PUMPS

Cheltenham Racecourse New Stand, (Cheltenham, UK)

This case study details the G-Core Limited team's involvement in the £45million project to deliver a district Ground Source Heat Pump system (GSHP) to the new five and a half-storey grandstand at Cheltenham Racecourse. The Client/Developer's ambition was to utilize ground source heating to provide space heating and cooling for the primary load of the building, independent of fuel oil and natural gas allowing the building to gain the benefits of the Governments Renewable Heat Incentive.

The Clients objective was to utilize a system capable of providing the base load to heat and cool the new building through a high efficiency, low carbon, in-obtrusive and renewable technology and through which they could provide their clients with an environment that can be easily regulated to suite demand.

Working closely with the consultant G-Core has installed and commissioned the system consisting of a Ground Energy Collector (16 x 130m deep borehole heat exchangers) coupled to a dual Viessmann ground source heat pump system, each providing heating and cooling to the grandstand to match demand.

www.gcore.co.uk

New Business School, Kingston University (Kingston UK)

This case study details the G-Core Limited team's involvement in the £20 million project to deliver a new building at the New Business School, Kingston University. The Client's ambition was to utilize ground source heating to provide the majority of the buildings cooling and heating. The team designed and installed one of the UK's deepest borehole Ground Energy Collector (GEC) consisting of 26 No. borehole heat exchangers, each to a nominal depth of 250m below ground level. The GEC was coupled to a single Heat Pump, which provided high efficiency heating, cooling and simultaneous heating and cooling.

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The design of the GSHP system design was based on the Employer's requirement to comply with local planning requirements, achieve a BREEAM rating of 'excellent' and to utilise the free cooling capability of a simultaneous GSHP system. The design took into account the geological and hydro-geological conditions underlying the site, the heat extraction and dissipation capacity of the ground and annual heating, cooling and simultaneous load profile of the proposed building. Available space for the GEC was minimal due to significant ecological constraints (rare grass and badger sets) and the surrounding University site remained operational throughout the works. The GEC design was validated using a Thermal Response Test, which was completed on the first Borehole Heat Exchanger (BHE). This ensured the final GEC model and design was correct to provide longevity of GEC over the 50 year lifetime of the GSHP system. The system is designed to work at maximum efficiency whilst meeting the buildings heating and cooling demands throughout its design life of at least 50 years.

www.gcore.co.uk

Scottish Crime Campus, Gartcosh (Scotland)

The development incorporated a Ground Source Heat Pump system (GSHP) to provide both Megawatt capacity space heating, cooling and simultaneous heating and cooling to the building in order to achieve the current and future operational requirements of the Crime Campus. The main building consists of a central atrium with transepts, consisting of offices, forensic laboratories and support facilities. The development is fully operational and accommodates 1100 people. The team designed and installed one of the largest borehole Ground Energy Collector (GEC) consisting of 53 No. borehole heat exchangers, each to a nominal depth of 150m below ground level. The GEC was coupled to a multiple Megawatt capacity Heat Pump system to provide high efficiency simultaneous heating and cooling. The design of the GSHP system design was based on the Employer's requirement to comply with local planning stipulations, to make large CO2 and operational cost savings and to provide for the heating and cooling needs of the various facilities within the building. The design took into account the geological and hydro-geological conditions underlying the site, the heat extraction and dissipation capacity of the ground and annual heating, cooling and simultaneous load profile of the proposed building.

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Robert Gordon University (Aberdeen UK)

The stunning new development designed to underscore Robert Gordon University's ambition to raise its global profile is remarkable in many ways, not least the low carbon footprint of the central campus building. The stylish new main campus building which has a superb setting on the banks of the River Dee houses the largest commercial Ground Source Energy System (GSES) in Scotland, recently commissioned by GI Energy.

By drawing on the heat stored naturally underground - and returning excess heat from the building to the ground – the GSES provides a truly renewable form of heating and cooling that dramatically cuts the building's carbon footprint. Its performance is expected to outstrip conventional forms of heating and air conditioning: for every kilowatt of power required to run the system, up to five kilowatts of heating and up to six kilowatts of cooling should be provided.

www.gienergy.net

CASE STUDIES – AUTOMATED PARKING SYSTEMS

The Cube Car Park(Birmingham – UK)

The Cube is a development in Birmingham which has the UK's largest automated parking system. A new car park in Birmingham has a sophisticated £2m robotic system that enables cars to park themselves. The car park is 20m (65ft) below canal-side office and apartment development the Cube. Beneath The Cube is the UK's largest fully automated, state-of-the-art car park which offers drivers hassle-free, secure parking. Providing drivers with the safest, cost-effective public parking in the center of Birmingham, users can access their vehicles without having to enter dimly light underground parking bays, so often found in many urban areas

Once you have purchased your permit, drive your vehicle into one of four transfer garages and then get out. The car is then scanned and transported to the parking area using an automatic lift. The car park system places the vehicle for you in an allocated, underground space, providing quick and easy, stress-free parking, where it stays safely stored until you are ready to return.

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When picking up your car, simply scan your pass at the transfer garage and the car will be safely brought back up to you. From arriving at the carpark to the return of your vehicle only takes two to three minutes and the system even turns the car around so that it is facing the right direction, ready for exiting.

Please find below the link for the video for the car park.
https://www.youtube.com/watch?v=JqIQA_wiyuU

http://www.thecube.co.uk/

Aston Martin Switzerland.

Luxury, handcrafted sports cars deserve special treatment, even when parked. That's why Aston Martins' only exclusive Swiss dealer in St. Gallen is incorporating a highly-efficient and secure automated parking system into its new dealership

Aston Martin St. Gallen builds a new dealership that combines features of the iconic sports car brand with typically Swiss characteristics to create a unique and luxurious ambience. What makes this dealership even more special is the inclusion of an automated parking system (APS) supplied by Skyline Parking AG.

Besides optimizing in-house logistics, the new dealership integrates a state of the art car showroom. To impress the dealership's premium clients further, a push of a button has the APS quickly bring selected cars to the showroom for inspection. What goes unseen in the background is the premium storage for these special sports cars provided by the APS. Safe and secure, the APS not only eliminates dents, scrapes, theft and vandalism, it provides weather protection in a temperature-controlled, sealed parking area.

The Skyline L-Park automated parking system, one of the dealership's efficiency optimizing features, provides highly space-efficient and safe parking for up to 90 cars. With two underground levels, the Skyline Parking APS uses parking spaces with three different heights and four different lengths on six levels, to fit all of those cars into an area of less than 302 square meters (given a system height of 14m this means 47 m3per parking

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space). Skyline uses the fastest and most reliable conveyor transport system in the industry

Automated parking systems minimize the amount of land needed for parking cars by removing drivers and passengers from the parking process. Much like robotic valet parking, drivers and passengers exit their cars at the APS entrance. The empty cars are then transported to parking spaces within the APS by a fully-automated mechanical system. Automated parking systems save space by eliminating those features of conventional car parking facilities that are needed to accommodate people: driving lanes, ramps, oversized parking spaces (drivers and passengers must open car doors), lifts, walkways, handicapped parking areas, etc.

Automated parking systems also eliminate the emissions produced when cars drive to-and- from or circle around searching for parking spaces. Moreover, APS are inherently far safer for people than conventional parking facilities since no one must (nor can) walk through the parking area. Cars are dropped off and picked up in well lit, highly visible lobbies at ground level. Cars and property are also more secure since no one is driving or parking near them and there is no public access to parked cars once inside the APS. All these features make the Skyline L-Park a perfect complement for the high-tech dealership.

http://skyline-parking.com/wp/wp-content/uploads/2015/05/Aston-Martin-St-Gallen-PR-English.pdf