CHIPPING

MIXED USE DEVELOPMENT

SUSTAINABILITY & RENEWABLE ENERGY STATEMENT

Project No: **7/4472**
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Report Origin

	Name	Signature	Date
Prepared	P Walker	*P Walker*	28/10/2013
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P1	17th October 2013	Planning Issue
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CONTENTS

1.0 EXECUTIVE SUMMERY

The project consists of the redevelopment of Kirk Mill and the former HJ Berry chair making factory. It is proposed to convert Kirk Mill in to a Hotel. New dwellings will also be provided as part of the mixed-use development.

The purpose of this report is to outline the proposed measures to be included within the development proposals for sustainability and energy at the Planning Stage.

This Sustainability & Renewable Energy Statement has been produced to Support the Planning Applications in response to the Ribble Valley Borough Council, Core Strategy 2008 – 2028, A Local Plan for Ribble Valley. The following Policies are noted: -

1. **Policy DMG1: General Considerations**
   The code for sustainable homes and lifetime homes should be incorporated into schemes.

2. **Policy DME5: Renewable Energy**
   The Borough Council will support the development of renewable energy schemes, providing it can be shown that such developments would not cause unacceptable harm to the local environment or local amenity. In terms of the use of decentralised and renewable or low carbon energy in new development the authority will request that on new non-residential developments over 1000m^2 and all residential developments of 10 or more units that at least **10%** of their predicted energy requirements should come from decentralised and renewable or low carbon sources unless the applicant can demonstrate that this is not feasible or viable.

The energy strategy for the development is to minimise the energy consumed by a lean, mean and green approach.

It is proposed to utilisation a combination of Renewable and Low/Zero Carbon Technologies to provide a minimum of 10% of the energy demand.

2.0 INTRODUCTION

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Kirk Mill is an early example of an Arkwright-type cotton mill and a grade II listed building in Chipping, Lancashire. It was built in the 1780s on the site of a corn mill dating from at least 1544. There is a Mill Pond to the rear of the mill which was used to power the waterwheel within the mill.

It is proposed to convert Kirk Mill in to a Hotel. The redeveloped site will contain the following buildings: -

- The Mill (refurbishment)
- Seven Barn Cottages (part refurbishment and part new build construction)
- Hotel / Spa Building (new build construction)
- Trail Head (new build construction)
- Wedding Venue Building (new build construction)
- Kids Club (new build construction)
- Central plantroom mechanical plant (new build construction)

The estimated annual energy consumption for the proposed development will be calculated at detailed design stage using a combination of SAP Calculations for the dwellings and using IES Dynamic Thermal Simulation Model software for the hotel element.

It is proposed to utilisation a combination of Renewable and Low/Zero Carbon Technologies to provide a minimum of 10% of the energy demand.

Adjacent to the Kirk Mill site is a Cricket Pitch which will be redeveloped for Residential Units.

A new cricket pitch and Club House will be provided at an alternative site within Chipping village.

3.0 SUSTAINABLE ENERGY

The energy strategy for the development will be to minimise the energy consumed by a lean, mean and green approach as defined below: -

Lean - Use advanced building modelling and passive construction techniques as far as is cost effective.

Mean - Incorporate high efficiency systems and effective controls within the design.

Green - Incorporate renewable energy sources where necessary and economically viable to achieve targets or provide desirable benefits.

The energy demand reduction measures to be incorporated within the proposed development include the following: -

Lean

- Good Daylight Factors
- Building Envelope Insulation
- Glass Area and Specification
- Building Air Tightness
- Natural Ventilation Strategy
- Energy Sub-Metering

Mean

- High Efficiency Lamps and Luminaires
- Lighting Local Switching Zones
- Lighting Control Incorporating Presence Detection
- Lighting Control Incorporating Daylight Linked Dimming
- Power Factor Correction
- Optimized Plant Controls
- Local Control Zones for Heating and Cooling
- Variable Speed Drives
- Low Flow Taps
- Water Leak Detection
- Automatic Controls

Green

- Renewable energy sources.
- Low / Zero Carbon Energy Sources

4.0 THE OUTLINE PLANNING APPLICATION

The Outline Planning Application consists of the following elements of the proposed scheme: -

1. Church Raike Housing, 56 dwellings are proposed on the former cricket pitch.

2. Malt Kiln Brow Housing – four dwellings are proposed in the field accessed from Malt Kiln Brow.

The proposed dwellings will incorporate the following sustainable elements: -

a. Code for Sustainable Homes. The dwellings will be assessed using the Code for Sustainable Homes scheme.

b. Building Regulations AD L1A. The requirements of the current / applicable Building Regulations AD L1A will be complied with in full. SAP calculations will be completed for each dwelling and an Energy Performance Certificate (EPC) provided.

c. Energy. Each residential unit will have at least 10% of its predicted energy requirement provided from decentralised and renewable or low carbon sources.

d. Building Envelope Thermal Performance. The dwelling construction and envelope U-Values will to be enhanced to exceed minimum requirements of Building Regulations AD L1A.

e. Building Air Permeability. The dwelling construction will to be enhanced to exceed minimum air permeability requirements of Building Regulations AD L1A.

f. Ventilation. Each dwelling will be provided with a method of ventilation in full compliance with Building Regulations AD F.

g. Lighting. Each dwelling will be provided with a low energy lighting solution in compliance with the Domestic Building Services Compliance Guide.

h. Space Heating & Hot Water. Space heating and hot water systems will be provided with local controls in full compliance with the Domestic Building Services Compliance Guide.

i. Water Use Reduction. Each dwelling will be designed to incorporate low water use appliances.

5.0 THE DETAILED PLANNING APPLICATION

The Detailed Planning Application consists of the following elements of the proposed scheme:

1. The Mill (refurbishment)
2. Seven Barn Cottages (part refurbishment and part new build construction)
3. Hotel / Spa Building (new build construction)
4. Trail Head (new build construction)
5. Wedding Venue Building (new build construction)
6. Kids Club (new build construction)
7. Central plantroom mechanical plant (new build construction)

The proposed hotel element of the development will incorporate the following sustainable elements: -

a. The estimated annual energy consumption for the proposed development will be calculated at detailed design stage using IES Dynamic Thermal Simulation Model software for the hotel element. The hotel will be provided with an Energy Performance Certificate (EPC).

b. Building Regulations AD L2A and ADL2B. The requirements of the current / applicable Building Regulations AD L1A New Build and AD L2B Refurbishment will be complied with in full.

c. Energy. Each proposed hotel development will have at least 10% of its predicted energy requirement provided from decentralised and renewable or low carbon sources. Technologies considered feasible for this development include the following: -
   - Hydro-Electric Power (HEP) within the Chipping Brook watercourse.
   - Hydro-Electric Power (HEP) within the Kirk Mill water wheel using the adjacent mill pond head of water.
   - Centralised district heating scheme for space heating and domestic hot water generation. The heating medium will be generated via a combination of a bio-mass boiler and air source heat pumps.
   - Ground source heat pump coupled to a slinky submerged in the mill pond for generation of heat medium for space heating and domestic hot water generation for Kirk Mill.

   Refer to Appendix A – Overall Site M&E Services Plant Schematic for details of the integration of the district heating scheme and renewable or low carbon technologies in to the proposed development.

d. Building Envelope Thermal Performance. The new build element of the hotel construction and envelope U-Values will to be enhanced to exceed minimum requirements of Building Regulations AD L2A.

e. Building Air Permeability. The new hotel construction elements will to be enhanced to exceed minimum air permeability requirements of Building Regulations AD L2A.

f. Ventilation. The hotel development will where practical incorporate a Natural Ventilation Strategy. The ventilation strategy will be in full compliance with Building Regulations AD F. Ventilation fans will be selected with a specific fan power (SFP) to exceed the minimum requirements of Building Regulations AD L2A.

g. Lighting. The hotel development will be provided with a low energy high efficiency lamps and luminaires. The lighting will be provided with automatic control systems incorporating

presence detection and daylight linked dimming. The lighting will comply / exceed the requirements of the Non Domestic Building Services Compliance Guide.

h. Automatic Controls. Mechanical plant will be provided with automatic optimised controls to ensure the efficient operation of mechanical services. Temperature and CO_2 sensors will be incorporated to provide close control of heating, cooling and ventilation plant. The controls systems will comply / exceed the requirements of the Non Domestic Building Services Compliance Guide.

i. Local Zone Controls – local zone controls for Heating and Cooling systems will be provided to ensure comfort control for occupants and reduce waste energy associated with over heating or over cooling. The controls systems will comply / exceed the requirements of the Non Domestic Building Services Compliance Guide.

j. Variable Speed Drives – pumps, compressors and ventilation fans will be provided with variable speed inverter drives to reduce energy consumption.

k. Water Use Reduction – water consumption will be reduced by incorporating low flow taps, showers and reduced water volume toilet flushing.

l. Sub-Metering – sub-metering will be introduced to enable a minimum of 90% of the development energy to be assigned to an end use. Low and zero carbon technologies will be separately metered. Automatic meter reading will be provided.

APPENDIX A – OVERALL SITE M&E SERVICES PLANT SCHEMATIC

ELECTRICAL HEATING & HOT WATER

INCOMING BOOSTED COLD WATER

INCOMING POWER SUPPLY

TRAIL HEAD BUILDING

AIR CONDITIONING FAN COIL UNITS OR CASSETTE UNITS

VRF AIR SOURCE HEAT PUMP
FIT - NO
RHI - NO

CLOSED LOOP SLINKY IN MILL POND

GROUND SOURCE HEAT PUMP
FIT - NO, RHI - YES

LTHW WET HEATING

BCWS TO OUTLETS

HOT WATER TO OUTLETS

HOT WATER RETURN

HOT WATER CYLINDER OR PLATE HEAT EXCHANGER

ELECTRICAL IMERSION HEATER

EMERGENCY ELECTRICAL IMERSION HEATER

RETURN PUMP

HRV

????? LITRE HOT WATER CYLINDER

BCWS

EXPANSION VESSEL

PRV

STR

SECTION BOARD

WEDDING VENUE

WEDDING VENUE

HYDRO ELECTRIC WHEEL
FIT - YES, RHI - NO

MILL BUILDING

BARN BUILDING

NEW HOTEL & SPA BUILDING

???Ø BCWS

???Ø HTG F

???Ø HTG R

???A TP&N

MAIN LV SWECHPANEL

????A ACB

????A

ELECTRICITY METER 400V/3Ø/50Hz

ENWL SUB-STATION

HYDRO ELECTRIC IN RIVER
FIT - YES, RHI - NO

BIOMASS FUEL PELLET STORAGE

BIOMASS BOILER
FIT - NO
RHI - YES

AIR SOURCE HEAT PUMP
FIT - NO
RHI - NO

???Ø HTG F

???Ø HTG R

AIR VENT

DIRT & AIR SEPERATOR

DRAIN

?.?? L/S @ ?? KPA

80oC

60oC

DOSING POT

???Ø MCWS

SCREENED OVERFLOW AND WARNING PIPE

COLD WATER TANK

8,000 LITRES
4,000 L x 2,000 W x 2,000mm H
2 COMPARTMENTS

SCREENED VENT

VENT

DRAIN

?.?? L/S @ 4.5 BAR

BOOSTED WATER PUMP SET

PRESSURATION UNIT

EXPANSION VESSEL

PRV VALVE

???Ø

???Ø TCWS

CENTRAL PLANTROOM

???Ø INCOMING MAINS COLD WATER SERVICE

Rev	Date	Description	By	Check	App.
P1	27.06.2013	PRELIMINARY ISSUE	AH	PGW	SRH

Client	53N LTD
Project	CHIPPING PROPOSED HOTEL DEVELOPMENT
Office	ALTRINCHAM
Discipline	MECHANICAL
Title	OVERALL SITE M&E SERVICES PLANT SCHEMATIC

Drawn	AH	Date	JUNE 2013
Checked	PGW	Scale @ A1	NTS
Approved	SRH	Status	PRELIMINARY

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