SCHEDULE OF RENEWABLE ENERGY ASSETS AND ENERGY EFFICIENCY MEASURES



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Proposal : Demolition of Class Q Consented Agricultural Buildings and Erection of Three Dwellings, Associated Hard and Soft Landscaping and Creation of a Re-wilding Area at Witteman Nurseries South Drove, Spalding. Lincs. PE11 3BD

February 2024

Project No JDA/2023/720

1.0 Introduction :

1.1.1 This statement provides details of proposed renewable energy assets for the Demolition of Class Q Consented Agricultural Buildings and Erection of Three Dwellings, Associated Hard and Soft Landscaping and Creation of a Re-wilding Area at Witteman Nurseries, South Drove, Spalding. Lincs. PE11 3BD

It is the purpose of this document to set out detials of the proposed mechanical and electrical installation and all the items to be included in the proposed dwelling that would make it both innovative and significantly 'off-grid'.

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CAR CHARGING

A car charging point will be provided to serve the properties.



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AIR SOURCE HEAT PUMPS

It is proposed to install 3no Air Source Heat Pump per units - to be located where indicated. The units will be Mitsubishi Ecodan single phase Mitsubishi 14kW R32 1Ph Mono ASHP Zbdn Standalone Pkg or equivalent.

SOUND PRESSURE LEVEL AT 1M (dBA) - 45The system will provide hot water and heating and, in summer months can be switched to provide cooling.



The ASHP Installation will comply with the Domestic Building Service Compliance Guide - Dept for Communities and Local Government 2001 and BS EN15450 Tables C1 & C2 with a Seasonal Performance Factor (SPF) of at least 2.7.

The heating system is to be underfloor with water supply temperatures in the range of 30c to 40c. The Coefficient of Performance (CoP) is to be not less than 2.2 for space heating and 2.0 for domestic hot water. The Seasonal Performance Factor will be no worse than as described in Table C1 of BS EN 15450. The system will meet the minimum requirements for installation and controls in Table 35 for heat pumps.

The water distribution system is to be arranged for reverse return operation or arranged with a low loss manifold system to maximize efficiency and ease commissioning and future maintenance. Pipework not contributing to the space heating system will be insulated to prevent heat loss. External pipework between the unit and the house to be insulated to the TIMSA Guide. The internal water distribution circuit should be protected by an anti freeze solution as recommended by the ASHP manufacturer.

For full heating, the ASHP and any supplementary domestic HW heating should be capable of supplying water in the range of 60c to 65c. The domestic hot water (DHW) system should include a tank thermostat and a time clock to optimise the time taken to heat the water.

Heat pump unit controls to include :

1. control of water pump operation (internal and external)
2. control of water temperature for the distribution system
3. control of outdoor fan operation
4. defrost control of external airside heat exchanger
5. protection for water flow failure
6. protection for high water temperature
7. protection for high refrigerant pressure
8. protection for air flow failure

External controls to include :

1. room thermostat to regulate the space temperature and interlocked with the heat pump operation
2. timer to maximize the operation of the heat pump

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WOOD BURNER INSTALLATION

Space heating will be augmented by the installation of 1no Clearview 750 14 kw unit per dwelling - refer to floor layouts. HETAS approved installation. Flue to be fitted in compliance with Approved Document J BS EN 15287, BS EN 1443, BS EN 1806 and manufacturer's details.



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LIMITING THE EFFECTS OF SOLAR HEAT GAINS IN SUMMER
Reasonable provision is to be taken to limit solar gains in compliance Approved Document L1A.
Excessive Solar gains to be checked using SAP 2009 Appendix P and consideration given to provision of adequate daylight as detailed in BS 8206 -2 Code of Maintaining Adequate Level of Daylight.

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LIMITING HEAT LOSSES AND GAINS
In accordance with Table 4.4 Approved Document L
Insulation to be provided to:
- Primary circulation pipes for domestic hot water.
- Primary circulation pipes for heating circuits where they pass outside the heated living space and voids to be insulated.
- Pipes connected to hot water storage vessels for at least 1m from the point at which they connect to the vessel.
Secondary circulation pipework.

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OVERHEATING
OVERHEATING MITIGATION
Adequate means of removing excess heat and limiting solar gains to be provided.
Compliance to be demonstrated by using either:
- The simplified method for limiting solar gains and providing a means of removing excess heat as set out in Section 1 of Approved Document O. Compliance check list (AD O Appendix B) to be provided to demonstrate compliance, or
- The dynamic thermal modelling method as set out in section 2 of Approved Document O, using the guidance set out in - CIBSE TM59 methodology for predicting overheating risk.
Report to be provided that demonstrates that the building passes CIBSE's TM59 assessment of overheating.
Consideration given to provision of adequate daylight as detailed in BS 8206 -2 Code of Maintaining Adequate Level of Daylight, noise pollution and security.

Solar gains in summer to be limited by any of the following means:
a. Fixed shading devices, comprising any of the following.
i. Shutters.
ii. External blinds.
iii. Overhangs.
iv. Awnings.

Removing Excess Heat
Building with cross ventilation - moderate risk location
Building or parts of the building with cross ventilation to be provided with:
Total minimum free area to be the greater of the following –
a. 9% of the floor area
b. 55% of the glazing area
Bedroom minimum free area to be 4% of the floor area of the room
The equivalent area of the opening to be assessed by either of the following means:
a. Measurement of the product to BS EN 13141-1.
b. Calculation using Appendix D Approved Document L.

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a. 9% of the floor area
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Bedroom minimum free area to be 4% of the floor area of the room
The equivalent area of the opening to be assessed by either of the following means:
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b. Calculation using Appendix D Approved Document L.

Limiting Solar Gains
Maximum allowable glazing of the building or part of the building and the most glazed room are to be determined using Table 1.1 or 1.2 of Approved Document O, using the orientation of the façade with the largest area of glazing.
Appropriate shading for any building in a high risk location to be provided by either:
a. External shutters with means of ventilation.
b. Glazing with a maximum g-value of 0.4 and a minimum light transmittance of 0.7.
c. Overhangs with 50 degrees altitude cut-off on due south-facing façades only.

Dynamic Thermal Modelling
The following guidance to be followed to demonstrate compliance:
a. CIBSE TM59 methodology for predicting overheating risk.
b. The limits on the use of CIBSE TM59 methodology.
c. The acceptable strategies for reducing overheating risk.
Building control to be provided with a report that demonstrates that the building passes CIBSE TM59 assessment of overheating.

Providing Information - Overheating
- The owner of the building to be given information to allow them to use the overheating mitigation strategy,
- Sufficient information about the overheating mitigation strategy and its maintenance requirement to be given to the owner, information to include:
- Overall overheating mitigation strategy
- Location of each element of the strategy
- Instructions for the operation of each element of the strategy
- The time of day the different parts of the strategy should be used
- The time of year the strategy should be used
- Manufacturer’s contact details
- The location of controls and instruction for setting of controls
- The location of sensors and how to recalibrate them
- Cleaning and maintenance instructions
- Home User Guide to include a section on ‘Staying cool in hot weather’

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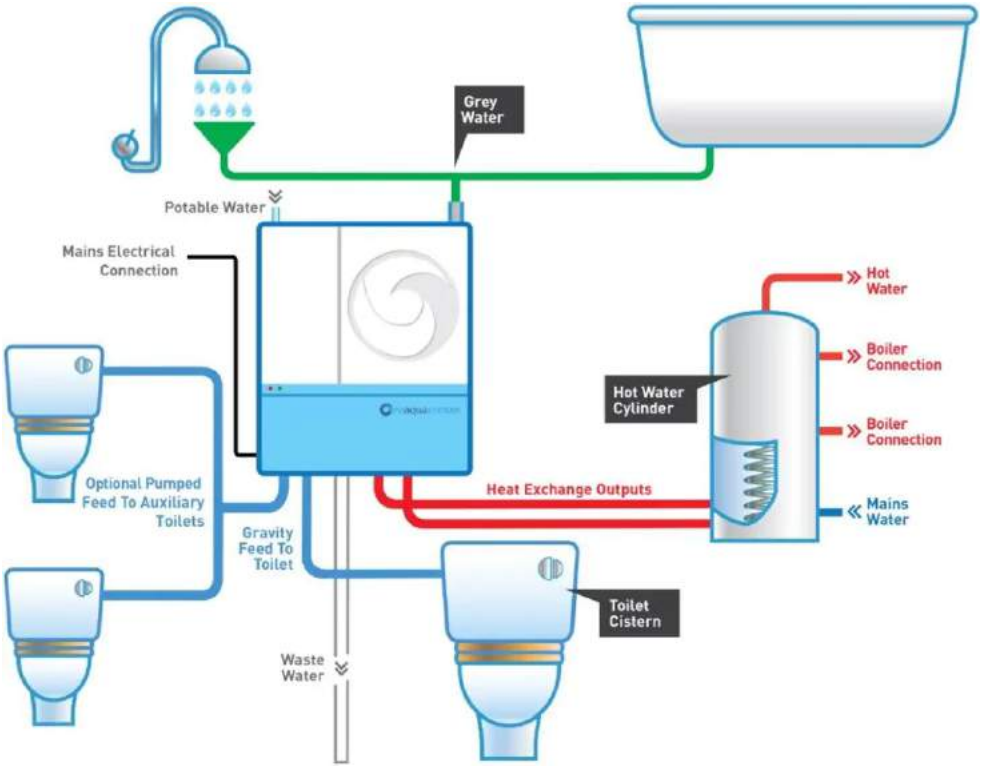
MECHANICAL VENTILATION WITH HEAT RECOVERY
Mechanical system to be installed in accordance with manufacturer's details. Details of system to be given to BCB.
Minimum extract ventilation extract rates to be:
Kitchen – 13 I/s
Utility room - 8 l/s
Bathroom – 8 l/s
Sanitary accommodation – 6 l/s

The sum of all extract ventilation in the units on its continuous rate, to be at least the whole dwelling ventilation rate given in Table 1.3 Approved Document F.
The minimum whole dwelling ventilation rate for the supply of air to the habitable rooms to be 0.3 litres per second per m2 of internal floor area.
System to include either manual or automatic controls (i.e. humidity sensors) to operate between trickle and boost modes.
Mechanical extract system to be performance tested to BS EN 13141 -7.
Mechanical supply terminals should be located and directed to avoid draughts.
To ensure good transfer of air through the dwelling there should be an undercut of minimum area 760mm in all internal doors above the floor finish. This is equivalent to an undercut of 10mm for a standard door.
System to be designed to avoid the moist air from the wet rooms recirculating to the habitable rooms.
To avoid unintended air pathways, background ventilation should not be installed with mechanical ventilation with heat recovery.
Mechanical ventilation system to be designed and installed to minimise noise.
Access to be provided for maintaining and cleaning ventilation systems.
Rigid ducts to be used wherever possible. Flexible ductwork only to be used for final connections, in lengths no more than 1.5m. Ductwork to meet BSRIA's BG 43/2013
Any ducting passing through a fire resisting wall/floor or fire compartment to be adequately fire stopped, provided with suitable dampers and/or fire collars or in fire resisting trucking in compliance with Approved Document B.
Mechanical ventilation systems to be commissioned in accordance with Approved Document F. Appendix C, completion checklist, commissioning sheet and air flow rate test results to be given to the Local Authority on completion.
The owner to be provided with information as listed in Approved Document F including:
- information about the building's ventilation system and maintenance requirements
- the operating and maintenance instructions
- the design flow rates
- the completed commissioning sheet
The information should be provided in a non-technical and clear manner.
A Home User Guide to be provided for the dwelling containing a section on 'Ventilation' that provides nontechnical advice on the ventilation systems provided.
Systems to ensure that they use no more fuel and power than is reasonable in the circumstances in accordance with Approved Document L.

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GREYWATER RECOVERY SYSTEM
Greywater recovery system to be installed and commissioned in accordance with the manufacturer's details.
All pipework carrying greywater to be clearly marked and labelled in accordance with the Water Regulations Advisory Scheme Information Guidance Note 90-02-05 and BS 1710:1984 'Identification of pipelines and services'
Installation to comply with the Water Supply (Water Fittings) Regulations 1999 and suitable materials to be selected from the Water fittings and Materials Directory. Pipes and fittings to be both recognizable and distinguishable from that supplying mains waste.
The reclaimed water system to be designed, operated and maintained so as to deal adequately with the contaminants, solids and organisms in the source waters. A suitable hazard assessment to be undertaken and the necessary safeguards adopted. The chemical, physical and biological properties of proposed water sources to be measured as part of the design and commissioning of the reclaimed water system. Water quality monitoring and reporting arrangements to be put in place.
Suitable fluid Category 5 level (airgap) of backflow prevention to be provided.
Access points for maintenance and clearing of blockages to be provided and filters to be easily accessible for cleaning.
Adequate ventilation to be provided.

Rainwater storage systems to be covered with screens on both inlets and outlets. Insulation to be provided to minimise heat gain and for frost protection. Periods where water is likely to be static for over a week are to be avoided.
Homeowner to be provided with clearly worded operating, maintenance and safety instructions, including instructions for the safe disposal of treatment chemicals or residues.



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AIR PERMEABILITY AND PRESSURE TESTING
Reasonable provision shall be made to ensure the dwellings are constructed to minimise unwanted air leakage through the new building fabric. The new dwelling is to be pressure tested by a specialist registered with the British Institute of Non-destructive Testing in compliance with Regulation 43 of the Building Regulations.

The measured air permeability to be not worse than 10 $m^3/(h.m^2)$ at 50 Pa or in compliance with the TER design limits, ensuring the DER calculated using the measured air permeability is not worse than the TER.
Where the buildings are not to be tested an assessed air permeability to the value of 15 $m^3/(h.m^2)$ at 50 Pa is to be assumed for the purpose of the TER.
If the required air permeability is not achieved, then remedial measures should be undertaken and a new test carried out until satisfactory performance is achieved.
A copy of the test results to be sent to Building Control no later than 7 days after the test has been carried out.
The Design Air Pressure target is to be between 3 and 4.

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WATER EFFICIENCY
The estimated water consumption per unit not to exceed 125 litres per person per day in accordance with Approved Document G2. Water Efficiency to be calculated using the 'Water Efficiency Calculator for

New Dwellings' and results submitted to building control before works commence on site.
Water calculation to be in compliance with Code for Sustainable Home Level 3/4 as stipulated by the local Planning Authority. Example calculation below;

WC 5/3 (dual flush)
Taps (excluding kitchen taps) 4
Baths 180
Shower 8
Kitchen sink taps 6
Washing machine 8.17 (not supplied)
Dishwasher 1.25 (not supplied)
Water recycling 0 (not supplied)
Predicted per capita consumption (Code) 103.28

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WASTEWATER HEAT RECOVERY SYSTEM (WWHRS)
All showers to connect to instantaneous WWHR with 36% recovery efficiency utilization of 0.98, including showers over baths as detailed in the SAP report.
Recovery system and components to be independently tested and assessed by BRE. All works to be in compliance with Approved Document H and L.
All boxing off to be accordance with NHBC standards and Approved Document E.
Installation and water fittings to be compliant with The Water Supply Regulations 1999 and BS 6920.
Design stage checklist to be completed and system to be installed and commissioned by a qualified plumber.
Operational and maintenance instructions to be given to owner on completion.
System to have factory fixed NCM (SAP) Identifier label. An identical second NCM (SAP) identifier label is also required to a nearby service cupboard.
System to be installed vertically so that it is fitted on the floor below the shower.
WWHR units to be installed inside the building
WWHR unit and the drain connector to have min 10mm clearance from the any adjacent structure.
WWHR system not to be installed in an environment where the ambient temperature in naturally above 25oC to minimise the risk of legionella growth.
Supply temperature of at least 60oC to be maintained from the heat source and/or storage vessel.
An Approved single check valve prevention device providing backflow prevention to at least fluid category 2 to be fitted at the point of connection(s) between the water supply and the fitting or appliance.
Length of drainpipe between shower and WWHR system to be less than 3 meters as far as practicable.
Access points to be provided.
Any shut-off valves for inlet and/or outlet to be full flow (non-restricting) shut off-valves.
WWHR pipe to be the same nominal size as the waste pipe to which it is connecting.
Pipework between the WWHRS preheated water outlet and the water heater and the shower cold-water inlet(s) to be insulated in accordance with the specification for DHW primary circulation pipes defined in 'Domestic Building Services Compliance Guide'.

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AEROBIC FOOD DIGESTER
Sending food waste to landfill produces large quantities of methane, a greenhouse gas that is 25% more efficient than carbon dioxide in trapping heat within the atmosphere. Aerobic digesters accelerate natural processes of decomposition, producing only heat, water and carbon dioxide (a gas that's 1/20th the potency of methane). Digesters use naturally occurring bacteria to break down waste, and most can process anywhere from 20kg to 500 kg of food waste in a 24 hour period, depending on the size of digester.

The properties will be provided with a domestic scale aerobic food digester - EcoEcosse or the 'Baby Orca' unit as shown below or similar. The digester will divert ALL organic waste produced by the two properties from landfill - the resultant biogenic materiel will be used as an organic fertiliser to be used on the vegetable gardens shown on the site layout.

The digestion process effectively reduces the volume and weight of food waste that would otherwise be sent to landfill. Additionally by dehydrating and grinding the food waste the unit can greatly reduce the amount of greenhouse gas produced from processed food waste.

The dehydrated food waste can act as a soil amendment for household garden and landscaping uses. Research has identified that processed food waste can add beneficial nutrients (phosphorus, nitrogen, and potassium) to soil, which helps promote plant growth.



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SOLAR ELECTRIC (PHOTOVOLTAIC) - IF SHOWN
Installation to be in compliance with all manufacturer's details and specifications, the British Standard Approved Document For Photovoltaic (PV) and BS EN IEC 61730

Installation must not impair the weather tightness of the roofs. All penetrations through the roof to be weatherproofed and covered with suitable flashings, purpose-made tiles, etc.
Installation to have sufficient resistance to wind suction forces for the location. The installer to calculate the wind loads for the location (taking into account the local wind speed, site altitude and topography, building height and roof configuration) and choose components or kits with a declared wind resistance that exceeds those wind loads.
The roof structures to be designed to accommodate the load of the collectors, advice of a structural engineer to be sought if required
All penetrations to be weatherproofed through the roof covering with suitable flashings, purpose-made tiles, etc
All components to have adequate resistance to the external spread of flame in compliance with Part B4 of Approved Document B.
Ensure the panels are not fitted in the shadow of overhanging branches, a chimney or aerial.
For the installation of a grid-connected system, the local Distribution Network Operator (DNO) will need to be notified if the system output exceeds 16A per phase (Engineering Recommendation G83/1).
An electrical fused spur outlet will normally be required. Pumps and controls should be located so that they are accessible for maintenance.
Solar electric panels should be inclined as steeply as possible to ensure that rain and dirt run off quickly.
Ventilation to be provided around the inverter and control equipment.
Fix permanent labels to wiring, junction boxes, etc.
Ensure that the system is commissioned properly and test for correct operation.
Provide operating instructions and maintenance recommendations for the homeowner.
An EPC to be provided with Feed-in Tariff (FIT) application showing the energy efficiency of the building the installation is attached to or wired to provide electricity to is a level D or above.
System to be commissioned and tested for correct operation in accordance with the MCS 012 standard.
All electrical work to be undertaken by a Part P registered Electrician i.e. NAPIT, ELECSA and NICEIC.

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ON – SITE UTILITY BATTERY STORAGE
The renewable energy captured by the solar array will be stored in a Lithium Utility Battery - circa 6.4 kWh with 3.2kWh expansion pack - by LG or similar. This asset will be located in the Utility Rooms

Voltage Range : 45.2 V ~ 58.1 V
6000 cycles at 90% DoD (+25°C)
Maximum discharge current 110A
Nominal voltage (DC) 51.8V
Cooling via natural convection

Excess electricty will be exported to the Central Networks asset in South Drove via a 'two way Meter'. The connection will also provide emergency power back.



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General

A User Guide will be provided to enable the promotion of energy efficiency within the community of the new development and provide further resources to enable long term carbon and energy reduction by improved education on the use of the proposed Low Carbon Technologies and Local Renewable Energy Sources. They will enable the home user to understand and operate their property efficiently and make the best of what the local area has to offer.

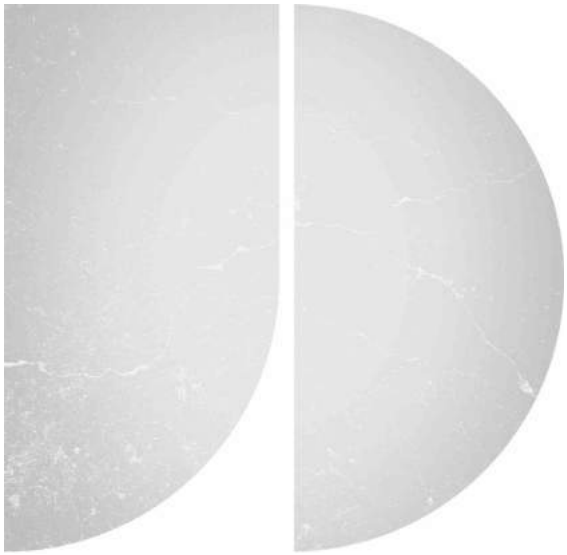
Reducing Energy Use & Increasing Energy Efficiency of Buildings
The proposed dwellings will produce at least 25% less CO2 than buildings built to current Building Regulation standards. This will be achieved by increasing the thermal performance of the building fabric by utilising Low Carbon technology and building to enhanced robust details to achieve high level of air tightness and controlled ventilation.

101. All major electrical appliances (i.e. refrigerators, freezers, washing machines, tumble dryers, washer/dryers and dishwashers) supplied with the property and workspace must be Energy
102. Saving Recommended.
103. The house will be provided with secure external drying spaces.
104. 100% of internal light fittings will be energy efficient.

105. External space lighting and security will be energy efficient. (subject to economic and planning constraints)

106. An Aerobic food waste digester will be installed to convert organic waste into a fertilizer to be used on the site
107. Passive ventilation systems will be used to minimise electrical consumption
108. Light and movement sensitive external lighting
109. A ventilated space for drying clothes will be provided within the buildings. This could be either
110. An unheated space with good ventilation, or a heated space with adequate, controlled ventilation.

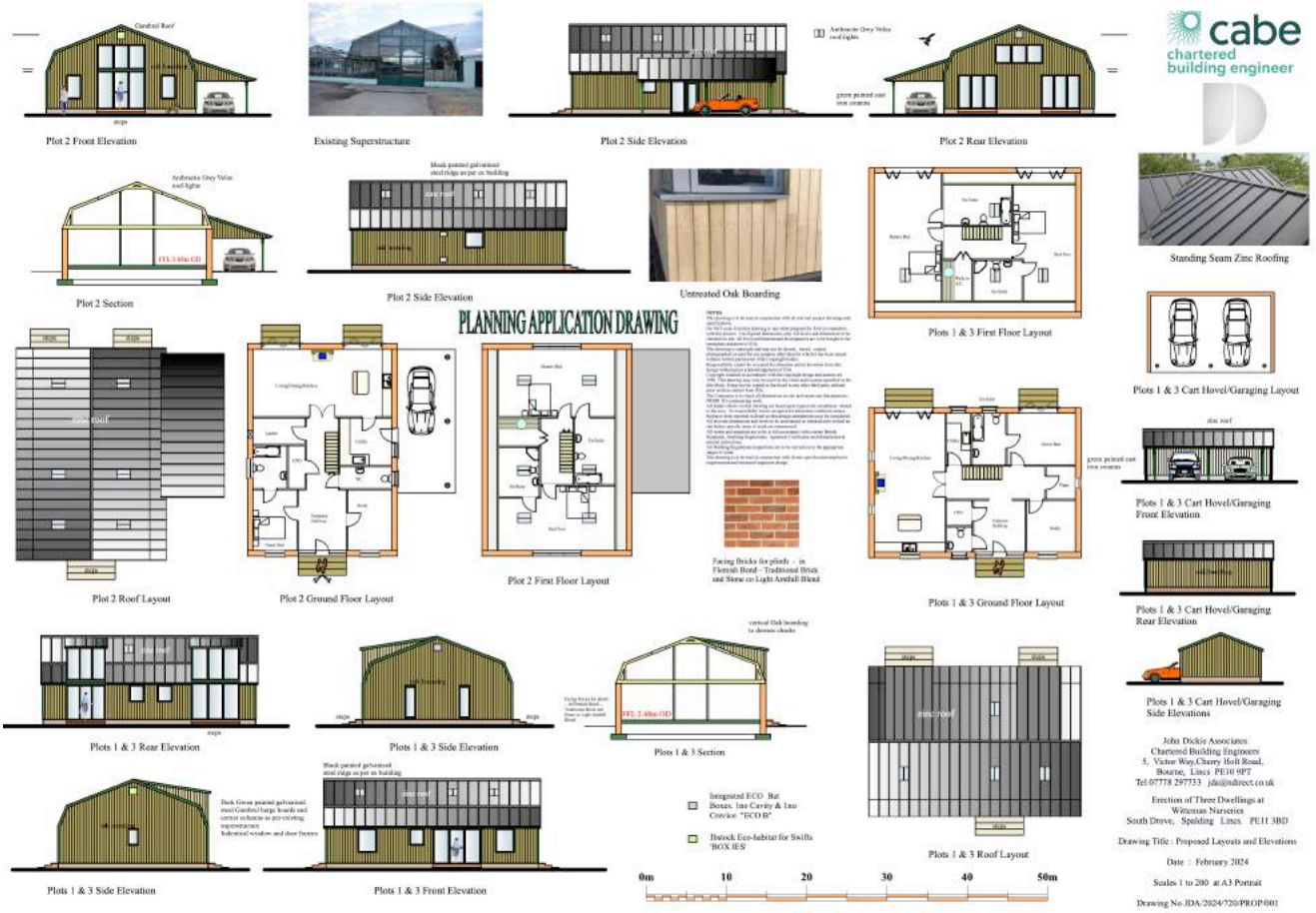
Note ;
The manufacturers of specific M&E plant and equipment is indicative and subject to an equivalent change.

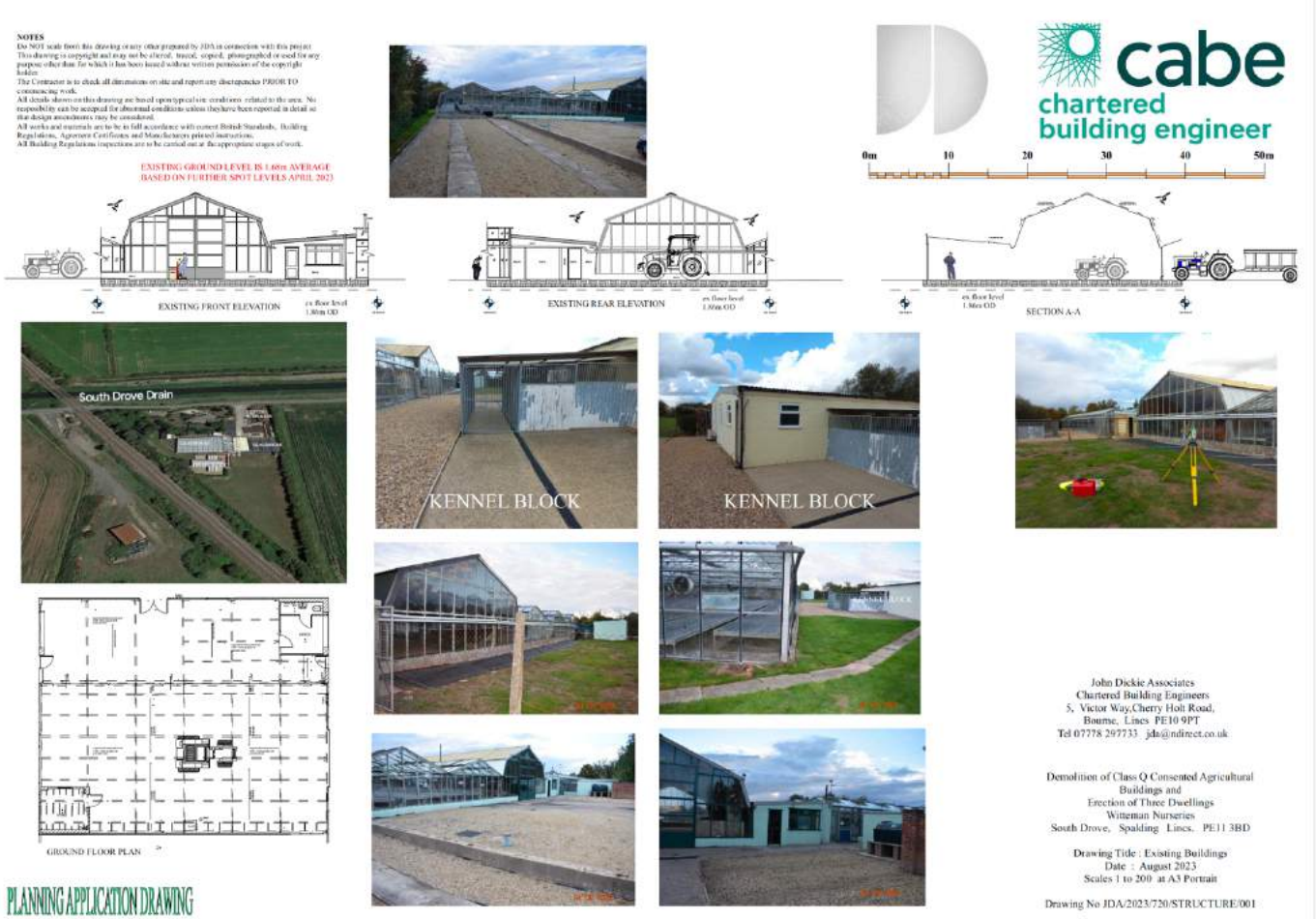


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Appendix A. Scheme Designs




Plot 2 Front Elevation
Existing Superstructure
Plot 2 Side Elevation
Plot 2 Rear Elevation
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Plot 2 Section
Plot 2 Side Elevation
Untreated Oak Boarding
Standing Seam Zinc Roofing
PLANNING APPLICATION DRAWING
Plots 1 & 3 First Floor Layout
Plots 1 & 3 Cart Hovel/Garaging Layout
Plot 2 Roof Layout
Plot 2 Ground Floor Layout
Plot 2 First Floor Layout
Facing Bricks for plinth - in Flemish Bond - Traditional Brick and Stone co Light Anthill Blend
Plots 1 & 3 Ground Floor Layout
Plots 1 & 3 Cart Hovel/Garaging Front Elevation
Plots 1 & 3 Cart Hovel/Garaging Rear Elevation
Plots 1 & 3 Rear Elevation
Plots 1 & 3 Side Elevation
Plots 1 & 3 Section
Plots 1 & 3 Cart Hovel/Garaging Side Elevations
Plots 1 & 3 Roof Layout
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Erection of Three Dwellings at
Witteman Nurseries
South Drove, Spalding Lincs. PE11 3BD
Drawing Title : Proposed Layouts and Elevations
Date : February 2024
Scales 1 to 200 at A3 Portrait
Drawing No JDA/2024/720/PROP/001
Integrated ECO Bat Boxes. 1no Carrier & 1no Crevice "ECO B"
Ibstock Eco-habitat for Swifts 'BOX IES'
0m 10 20 30 40 50m
Plots 1 & 3 Side Elevation
Plots 1 & 3 Front Elevation


NOTES
EXISTING GROUND LEVEL IS 1.68m AVERAGE
BASED ON FURTHER SPOT LEVELS APRIL 2023
cabe
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0m 10 20 30 40 50m
EXISTING FRONT ELEVATION
EXISTING REAR ELEVATION
SECTION A-A
South Drove Drain
KENNEL BLOCK
KENNEL BLOCK
GROUND FLOOR PLAN
PLANNING APPLICATION DRAWING
John Dickie Associates
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Tel 07778 297733 jda@ndirect.co.uk
Demolition of Class Q Consented Agricultural Buildings and
Erection of Three Dwellings
Witteman Nurseries
South Drove, Spalding Lincs. PE11 3BD
Drawing Title : Existing Buildings
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Scales 1 to 200 at A3 Portrait
Drawing No JDA/2023/720/STRUCTURE/001