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CSBT/SCL – Green Build Hub – Eden Project – PL24 2SG

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**To: Andy Medlin**  
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Falmouth Town Council  
**The Old Post Office**  
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## Kimberly Park Project – M&E Services Report V1

### 1. Introduction

This report has been prepared on instructions from Andy Medlin – Facility Manager of Falmouth Town Council as a pre-tender support document in conjunction with information from architect Michael Horman and QS Phil Crossley. It is anticipated that the report will be given to selected contractors and product suppliers to enable them to offer technical performance specifications and preliminary budgets. The principles and preferred options can then be included in the final tender documents. It is assumed that a sustainable design will be adopted to reduce the building carbon emissions and footprint beyond the minimum requirements of the current Part L Building Regulations and to allow the client to demonstrate an Energy Performance Certificate rating of B or better together with other environmental policies adopted by the Town Council to conform to grant funding criteria. Design and specifications will be developed further during the tendering process and included in Appendices to be subsequently attached to this report

### 2. Design Criteria

The following design criteria have been used to assist with plant capacity targets:

#### External

- Summer 28 degrees to 22 degrees Celsius
- Winter to minus 4 degrees Celsius

Internal winter- 1- 19 degrees Celsius +/- 1 degree Celsius

It is assumed at this stage there will be no provision for summer cooling equipment.

Ventilation standard assumed to be a minimum of 12 litres/sec per person either by natural and/or a MVHR system.

Noise criteria will largely be dictated by the sound studio requirements to be determined later.

Building air leakage will comply with Building Regulation and target EPC rating and should not exceed 5cu.m/sq,m/hr at 50 Pascals.

Internal Heat Gains assumed:

- People 90 W/person
- Lighting 7 W/sq.m
- Small Power 5 to 25 W/sqm (subject to recording studio specifications)

Building Monitoring System to be considered including submetering and software installation.

Lighting lux levels criteria assumed to be within the range of 200 to 300 internally and externally 10 with Ceiling reflectance 0.8 - Floor reflectance 0.2 - Wall reflectance 0.55

Provision to be reviewed for:

- Lighting and electrical power
- IT connectivity
- Battery storage units
- Sensors and controls
- Security/CCTV
- Emergency lights
- Fire Alarms
- Water mains supply
- Electric mains supply
- Drainage
- Sewerage
- Waste disposal

### 3. Plant and equipment:

A combined system for heat generation of various technologies should be considered to provide energy to replace the building heat loss and could include:

- An electric hot water cylinder
- Hot water solar panels
- Air source heat pump
- Ground (water) source heat pump
- Geothermal
- Electric radiant wall panels
- Hot water heat exchangers (radiators)

- On demand electric water heaters
- Photo voltaic solar panels (electric generation)
- Underfloor heating

#### 4. Heat Loss Calculations

Regardless of the combined systems referred to in 3.above they will require a minimum performance specification to replace the building heat loss experienced under normal user conditions. The average u-values of 0.2W/sqmK have been adopted based on information received to date. A preliminary assessment indicates demand will be about 2000 – 2500 British Thermal Units (BTUs). It is anticipated that the u- value of the extension elements will be lower than that of the existing building after refurbishment.

#### 5. Summary

Options to be considered:

- A pressurised buffer tank to supply the underfloor heating system receiving energy from an air sourced heat pump (ASHP) with back-up from an electric hot water cylinder.
- A pressurised buffer tank to supply the underfloor heating system receiving energy from a solar panel (HWSP) heat exchanger with back-up from an electric hot water cylinder.
- A mechanical ventilating heat recovery duct system (MVHR).
- The underfloor heating input could be kept separate from that required for hot water supplies possible with combined and/or individual electric units.
- The underfloor heating should provide a minimum core heat-loss replacement for the building but could be supplemented with localized electric radiant high-level units.
- Careful consideration should be taken of the building location to assess the respective performance of solar power and air sourced heat pumps.
- The proposed plant room extension to the public toilet building would accommodate the heating equipment and MVHR unit however alternative locations within the main building should be considered to avoid heat loss through transmission.

*S. Bradley*

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