Integration of Renewables

Wind Turbines on the Roof of Plymouth College of Further Education

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Introduction

- Situated South West of England
- Large FE college – 6,500 fte students
- Installation of two 6kWp wind turbines - Innovation Centre
- Facilities Manager
  - user experience
  - not expert

Background

- Innovation Centre 2,400m^2 opened 2001
- Good environmental design and technologies
- Average construction cost
- Prominent location exposed to prevailing winds

- Feasibility for turbines during building design
- Stub columns included during construction
- Initial planning consent

Funding

- BRITA in PuBs, including Tower Block and Photovoltaics
- EDF Energy
- Clear Skies
- Sustainable Energy Installations (SEI)

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Turbine Design and Installation

- Proven WT6000 6 kW
- Cut speed 2.5 m/s
- Rated wind speed 12 m/s
- Max rotation 200 rpm
- Blades 3 flexible
- Rotor diameter 5.6 m
- Generator direct drive
- Mast tilting, 9m hub height

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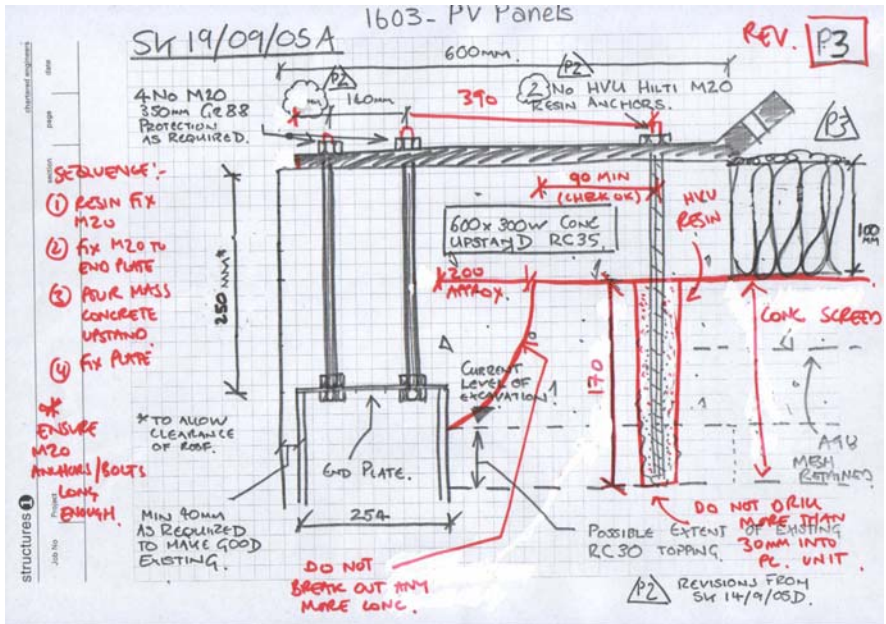
- Predicted output 33,800kWh/pa
- Value of electricity saved €2,400/pa
- Invertors
- Scheme cost
  - SEI quotation €85,800
  - Extras € 8,600

Installation 25-27 October 2005

- Planning and Building Regulation Consents

The Experience So Far

- Funding – delaying factor
- Designer and installer experience e.g. winching points



The Experience So Far

- Vibration
- Noise
- Local community

- Shadow flicker
- Real output

Conclusion

- Payback Period
- Structural Design Calculations essential
- Vibration
- Shadow Flicker

- Designer and Installer
- Vertical Axis or Horizontal Axis
- Much more than generators

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