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ENVIRONMENTAL

Technology Strategy Board
Retrofit for the Future Programme

Queenborough and Rushenden
Scope of Works

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1 Introduction and Background

The Technology Strategy Board (TSB) has awarded funding to deliver a retrofit project on the Isle of Sheppey in Kent, through their Retrofit for the Future (RFTF) programme. The aim of the RFTF programme is to deliver deep cuts in carbon emissions and energy use within the residential sector, through a set of 100 pilot projects. These pilots will install and test the latest in energy efficient technologies, measures and methods, and combine these with the most innovate energy generating technologies. In so doing, it is hoped carbon and energy demand savings of around 80% can be achieved.

The Sheppey project consists of 2 properties, 1 in Queenborough and 1 in Rushenden . Initial technical modelling and project development work has been carried out by BBP Regeneration in conjunction with the project delivery partnership, which includes the social landlord AmicusHorizon (the owner of the properties), WT Partnership (QS) and Daedalus Environmental Ltd (technical consultants). This work has provided two solutions for each of the properties in question. There is considerable overlap between the two, however there is also considerable differences in the energy generating technologies applied.

This document provides the scope of works required of the chosen contractor in delivering the work on behalf of the partnership. It provides a list (with detail, where required) of the various measures to be installed and the standards which need to be met. It does not provide any guidance of ***how*** these measures are to be installed, which is to be left up to the contractor.

The document is split into various sections covering the different measures and activities. Any clarification required should be directed in the first instance to antony.perry@wtpartnership.com, who is managing the contractual side of the process, on behalf of WT Partnership.

2 Insulation Measures[1]

2.1 Loft Package

2.1.1 Queenborough

- 400mm mineral wool blanket laid between and then across joists to achieve a U-value of 0.10
- Ventilation of roof spaces to be maintained to current level
- Replacement of existing loft hatch with insulated hatch panel, to match performance of remainder of loft space
- Removal of existing cold water tank
- See also requirements of MVHR system, below

2.1.2 Rushenden

- Relaying of existing insulation between joists
- Additional mineral wool blanket laid across joists to achieve a U-value of 0.10
- Ventilation of roof spaces to be maintained to current level
- Replacement of existing loft hatch with insulated hatch panel, to match performance of remainder of loft space
- Removal of existing cold water tank
- See also requirements of MVHR system, below

2.2 Walls Package

2.2.1 Queenborough

- Blown mineral wool cavity wall insulation to front and rear elevations (see ***CE252 - Cavity wall insulation in existing dwellings: a guide for specifiers and advisors, Energy Saving Trust*** for more guidance)
- Air ventilators and bricks crossing the cavity to be sealed (obsolete with MVHR – see below)
- Kingspan Kooltherm K17 insulated plasterboard on internal front and rear elevations. Allow for repositioning sockets etc as necessary. K17 to be fixed with adhesive, joints taped, MDF replacement window boards, plaster skim (see Kingspan website for more information)
- K17 to sit behind, rather than on, floor insulation measures (see below). This is to ensure thermal bridging is minimised – see ***CE83 Energy Efficient Refurbishment of Existing Housing, Energy Saving Trust*** for guidance
- Replacement skirting boards, mastic sealed above and below
- Further guidance on internal insulation can be found using the document ***CE17 Internal Wall Insulation (Energy Saving Trust).***

[1] See in general ***CE97 - Advanced insulation in housing refurbishment, Energy Saving Trust***

2.2.2 Rushenden

- Examination of existing cavity wall insulation – top up as necessary with blown mineral wool cavity wall insulation. Particular attention to wall areas under eaves, areas surrounding glazing, and bricked up door to front of property (see ***CE252 - Cavity wall insulation in existing dwellings: a guide for specifiers and advisors, Energy Saving Trust*** for more guidance)
- Air ventilators and bricks crossing the cavity to be properly sealed (obsolete with MVHR – see below)
- Kingspan Thermawall K5 60mm system to be applied to all three external elevations (front/rear/side), and rendered (total surface area to be installed approximately 100m^2). See Kingspan website for more information
- Kingspan Kooltherm K17 insulated plasterboard on ground floor external wall in utility area. Allow for repositioning sockets etc as necessary. K17 to be fixed with adhesive, joints taped, MDF replacement window boards, plaster skim

2.3 Doors Package

2.3.1 Queenborough

- Remove and dispose 2No. existing door sets
- Install 2No. doors with U-value 0.55 to retained openings

2.3.2 Rushenden

- Remove and dispose 3No. existing door sets
- 2No. door replacements with U-value 0.55 in retained openings (front centre, rear)
- Secondary front door opening replaced with filled cavity brickwork, 2m^2 (front right)

2.4 Ground Floor

2.4.1 Queenborough

- Spacetherm® C flooring laminate incorporating 18mm V313 grade chipboard and 10mm Spacetherm® blanket (sourced from proctorgroup.com / spacetherm.com) to cover all of the ground floor
- Replacement skirting boards, mastic sealed above and below
- Undercut internal doors for raised floor height (allow for replacement if doors not suitable for undercutting utilising existing ironmongery). Door lintels are **NOT** to be raised
- ***Floor finishes (carpet assumed) to be provided by Amicus Horizon***

2.4.2 Rushenden

- Remove existing floor covering to kitchen and utility area and replace with linoleum on completion. Remove all other ground floor coverings including skirtings and accessories and replace like for like on completion
- Spacetherm® C flooring laminate incorporating 18mm V313 grade chipboard and 10mm Spacetherm® blanket (sourced from proctorgroup.com / spacetherm.com) to cover the utility area, understairs cupboard, exposed kitchen areas and entrance

hallway/lobby. Kitchen cupboards are not to be removed or touched. Kitchen table to be removed then replaced to facilitate installation.

- Replacement skirting boards to be mastic sealed above and below
- Undercut internal doors for raised floor height (allow for replacement if doors not suitable for undercutting utilising existing ironmongery). Door lintels are **NOT** to be raised

2.5 Pipe work

2.5.1 Queenborough

- All exposed primary pipe work to be insulated with 9mm Armaflex or equivalent

2.5.2 Rushenden

- As above

2.6 Additional Insulation Measures

2.6.1 Queenborough

- Chimney balloon installed
- Fireplace boarded up with Kingspan insulated board (or equivalent) and sealed

2.6.2 Rushenden

- Porch roof to be reinsulated with vapour control layer, 145mm PUR fully bonded (Kingspan), a waterproof layer - single ply membrane (EPDM or TPO) laid to fall including firrings as necessary
- Insulation to be installed to remove any thermal bridge – attention to detailing in relation to external wall required. Porch roof insulation to sit below external wall insulation
- Gutter, down pipe and below ground connection into existing downpipe, including all trenching, etc.

3 Glazing

3.1.1 Queenborough

- Remove and dispose of existing windows including window boards and replace with: PVC, Low E, soft coat, argon filled double/triple glazing to achieve a U-value of 1.1
- Approximately 16.5m^2 total glazed area
- Particular attention to be paid to snug, air tight fitting of windows in relation to walls package (see above), and to minimise thermal bridging
- See the following for guidance
    - ***CE83 Energy Efficient Refurbishment of Existing Housing, Energy Saving Trust***
    - ***CE66 Windows for New and Existing Housing, Energy Saving Trust***

3.1.2 Rushenden

- Remove and dispose of existing windows including window boards and replace with: PVC, Low E, soft coat, argon filled double/triple glazing to achieve a U-value of 1.1
- Approximately 17.2m^2 total glazed area
- Particular attention to be paid to snug, air tight fitting of windows in relation to walls package (see above), and to minimise thermal bridging
- See the following for guidance
    - ***CE83 Energy Efficient Refurbishment of Existing Housing, Energy Saving Trust***
    - ***CE66 Windows for New and Existing Housing, Energy Saving Trust***

4 Appliances and Fittings

4.1.1 Queenborough

- Washing machine - A rated Indesit IWB5113
- Fridge freezer - A Rated Indesit BAN12NF
- Electric hob (No rating) - Indesit PI604WH
- Electric cooker - A rated Beko OI2210OX

4.1.2 Rushenden

- Washing machine - A rated Indesit IWB5113
- Fridge freezer - A Rated Indesit BAN12NF
- Electric hob (No rating) - Indesit PI604WH
- Electric double oven - A rated Indesit FID20WH
- New low flow /aerated water fittings throughout
    - Kitchen taps - restricted to 3l/min
    - Shower 9l/min, appropriate for pressurised system
    - Bath taps - no restriction

5 Air Tightness

5.1.1 Queenborough

- Fill / seal all unwanted gaps and penetrations through external fabric, including around skirting. Draughtstripping as required.
- Performance of building to be measured using air pressure testing. Finished project to achieve air permeability of 5m^3/m^2/hr@50Pa. Exceptional workmanship and care will be required to achieve this level. For further information and guidance, please see ***CE137/GPG224 Improving Air Tightness in Dwellings (Energy Saving Trust).***

5.1.2 Rushenden

- As for Queenborough

6 Lighting

6.1.1 Queenborough

- All internal light fittings to be replaced with fittings that only accept energy efficient lighting / CFLs

6.1.2 Rushenden

- All existing bulbs to be replaced with energy efficient bulbs / CFLs

7 Ventilation

7.1.1 Queenborough

- Appendix Q rated MVHR system to achieve minimum efficiency of 92%
- 2 wet room capacity, insulated (likely flexible) ductwork. Risers to be created as required
- Total number of rooms - 7 plus landing and hall
- Unit to be located in loft space

7.1.2 Rushenden

- Appendix Q rated MVHR system to achieve minimum efficiency of 92%
- 2 wet room capacity, insulated ductwork with risers to be created as required – making good and redecoration as necessary
- Total number of rooms - 8 plus landing and hall
- Located in loft space

8 Heating Systems, Metering and Controls

8.1.1 Queenborough

- Pressurised system using Baxi Ecogen micro CHP as main heat source, including all electrics
- All associated pre-insulated pipe work to property and civils as required
- 2No. Baxi SolarFlo ***in-roof*** collector panels - form openings in roof coverings for thermal panels and vents as necessary including all flashings. All connection pipe work to cylinder
- Hydraulic pump station and solar controller as supplied by Baxi
- Dual coil 210l cylinder with factory fitted insulation to depth of 80mm to be located in existing airing cupboard
- Specified for pressurised system
- Scaffolding as required
- Radiators to be replaced with appropriate sized high efficiency units, Stelrad Compact or equivalent
- Room thermostat and timer/programmer (ensuring separate hot water / heating control)
- Control and monitoring to be carried out by Wattbox. See separate Wattbox specification for more details

- Smart meters for electricity, gas and water usage to be installed. (Smart water meter to be installed by water utility company). Real time displays required for homeowner. Electricity meter to link to PV system to enable export of surplus generation and acquisition of Feed In Tariffs

8.1.2 Rushenden

- Pressurised system with main heating source to be Baxi 9kW biomass pellet stove and boiler, with removal of existing Bermuda back boiler and gas fire
- Vertical extension of fireplace to accommodate unit (reuse lintel) with flue as required using existing chimney
- 2No. Baxi SolarFlo ***in-roof*** collector panels - form openings in roof coverings for thermal panels and vents as necessary including all flashings. All connection pipe work to cylinder
- Hydraulic pump station and solar controller as supplied by Baxi
- Triple coil 210l cylinder with factory fitted insulation to depth of 80mm, specified for pressurised system, to be relocated in ground floor utility area, behind bricked-up door. Connection to biomass pellet stove boiler and solar panels as necessary
- Pipe work relocation as required from current location on first floor
- Radiators to be replaced with appropriate sized high efficiency units, Stelrad Compact or equivalent. TRVs to be fitted to each radiator
- Control and monitoring to be carried out by Wattbox. See separate Wattbox specification for more details
- Smart meters for electricity, gas and water usage to be installed. (Smart water meter to be installed by water utility company.) Real time displays required for homeowner. Electricity meter to link to PV system to enable export of surplus generation and acquisition of Feed-In Tariffs

9 Other energy generating technologies

9.1 Photovoltaics

9.1.1 Queenborough

- 10No. Sharp 160Wp photovoltaic panels (or equivalent to achieve 1.6kWp system), mounted ***on-roof***
- Inverter system, AC/DC isolating breakers
- Cabling between modules, inverter and distribution board
- Electricity generation display meter
- Scaffolding as required

9.1.2 Rushenden

- As for Queenborough

10 Builder's Works, Electricals and Removals

10.1.1 Queenborough

- All necessary builders works, forming openings, chasing, stripping out, making good etc as required
- All electrical amendments, including stripping out etc. as required
- Removal and disposal of:
    - cold water tank in the loft
    - existing back boiler
    - existing cylinder
    - prepay electricity meter to be replaced by smart meter

10.1.2 Rushenden

- As for Queenborough