Tower Hamlets Homes – Asset Management – Major Works Group

Engineering Service Option Assessment

Address

1 to 20 Shackelton house
Pursom Street
Wapping E1 9RT
Built in 1964
Cheviot LHO

Service and Background

Background
Shackelton house is mainly occupied by Elderly or venerable residences and no leaseholders. The Heating and Hot water needs for Shackelton House are provided via the small single story boiler room at the rear of the building. The hot water for each property is individually produced via low volume dumpy indirect Hot water cylinders which are sited in each kitchen under the draining board powered from the constant temperature heating circuit from the District Boiler house. Residents have complained of insufficient hot water volumes. The heating needs are provided by Fan assisted warm air units and supplemented by radiators, the heating is also connected to the constant temperature heating which operates at 75^0c all year. Residents have complained that the properties can get too hot in summer. In 2006 the Boiler equipment was updated and 3 fully modulating condensing Boiler which will be retained were fitted to the original 1964, heating distribution system. The distribution system is not suitable for energy efficient full condensing operation or fully weather compensated variable temperature operation, so the updated equipment is not operating as efficiently as it designed to. Shackelton house has no mains Gas service to dwellings only to the communal boiler equipment.

Option 1
Renewable Energy Enhanced Communal Heating & HWS Works
Renewal of indwelling heating and hot water services. Upgrading of and replacement of heating and hot water distribution system. Modification of the existing boiler house equipment to incorporate Solar hot water system, Air to water heat pumps assisted heating and Photovoltaic Solar panels will be installed to supplement the electrical supply for the boiler plant and blocks Landlord Electrical system.

Option 2
Renewable Energy Enhanced Communal Heating & HWS Works (No Solar HWS)
Option 2 includes all of the works of Option 1 excluding the Solar hot water system and modifying the Air to water heat pumps system to assist Hot water services in Summer.

Option 3
Individual Gas fired Central Heating
Decommissioning of the Community heating system, Request a complete Gas service from the Gas supplier and installation of Individual Gas fired Central Heating

Cost comparison

Option 1, Renewable Energy Enhanced Communal Heating & HWS Works

1.	Plant room works	£6,900
2.	Distribution System	£15,500
3.	Solar Hot water system (renewable Heat source)	£60,000
4.	Air Source Heat pumps (renewable Heat source)	£6,000
5.	Photovoltaic Solar (renewable Electrical)	£6,000
6.	Indwelling works	£48,000
7.	Building works	£19,000
8.	Preliminaries	£5,000
9.	Contingences	£10,000
	Works total	**£176,400**
	Total ink 9.32% fee	**£192,840**

Option 2, Renewable Energy Enhanced Communal Heating (No Solar HWS)

1.	Plant room works	£6,900
2.	Distribution System	£15,500
3.	Air Source Heat pumps (renewable Heat source)	£10,000
4.	Photovoltaic Solar (renewable Electrical)	£6,000
5.	Indwelling works	£48,000
6.	Preliminaries	£5,000
7.	Contingences	£10,000
	Works total	**£101,400**
	Total ink 9.32% fee	**£111,850**

Option 3. Individual Gas fired Central Heating

1.	Individual gas fired heating system Combination Boiler £4,000 x 20 properties	£80,000
2.	Decommission Community heating system	£5,000
3.	New Gas service to block including new Meters and supplies to dwellings	£200,000
4.	Contingences	£10,000
	Works total	**£295,000**
	Total ink 9.32% fee	**£322,464**

Please note this comparison is structured over the expected 20 year life of the Community scheme

Communal Heating System Option 1

Installation cost Ink fees	£192,840
Maintenance costs £1500 per year x 20 years	£30,000
Repair on demand costs £00 x 20 properties x 20 years	£00000
Repairs say £500 per year x 20 years	£10,000
Annual estimated Gas Consumption £10,800	
Energy saving of 25% or more over 20 years	
Estimated Gas consumption over 20 years	£162,000

Communal Heating System Option 2

Installation cost Ink fees	£111,850
Maintenance costs £1500 per year x 20 years	£30,000
Repair on demand costs £00 x 20 properties x 20 years	£00000
Repairs say £500 per year x 20 years	10,000
Annual estimated Gas Consumption	£10,800
Energy saving of 20% or more over 20 years	
Estimated Gas consumption over 20 years	£172,800

Individual Systems

Installation indwelling	£322,464
Annual Gas Safety check £60 x 20 properties x 20 years	£240,000
Repair on demand costs £90 x 20 properties x 20 years	£360,000
Boiler Replacement costs at 10 Years, £2,000 X 20 Prop	£40,000

Gas consumption is the resident's responsibility

Costs for comparison over 20 year period

Option1 Communal Heating System Including Gas	**£394,840**
Option 2 Communal Heating System Including Gas	**£324,650**
Option 3 Individual Gas fired Heating Systems	**£962,460**

The Communal heating scheme Involves

The replacement of the heating and hot water systems for this Communal serviced block is being approached with a view to making it a pilot project. The scheme is being designed to include sustainable and $C.O^2$ reducing energy initiatives. Air to water heat pumps reducing primary energy consumption; solar aided domestic hot water and photovoltaic solar panels which will reduce the landlord electrical cost for the block; cavity wall insulation and loft insulation to improve the thermal efficiency of the block is also underway this year.

The work carried out here will be invaluable in assessing the benefits for this type of block which is a staple of THH stock. The feedback will also help us assess how blocks including leaseholders can be sensibly promoted with regard to grant funding and leaseholders costs.

Grant Funding

As Shackelton house is in an area of financial depravation and as the above work deliver whole block energy saving measures, it is anticipated that CESP area funding under the Community Energy saving Programme can be set up providing a estimated grant of 20% to 60% of the capital expenditure of the renewable works and equipment. It is also anticipated that Governments recent Renewable Heat Incentive (RHI) funding will be applicable to this scheme, see below for RHI details. The renewable Heat source for the heating and hot water systems will not only provide low cost $C.O^2$ reducing energy it will also receive a source of income for 18 Years. The actual level of RHI funding is expected to between 4p to 15p per kW hour depending on the type of renewable Heat source.

So as a conservative example and as we are using a more then one renewable source ; Say 5p kW/hour x 30kw produced each hour = £1.50 per hour
18 hours a day = £27 per day
365 days a year £9,855 per year
18 year funding £177,390

Note depending on weather conditions and system demand the volume of renewable Heat produced will vary.

RHI funding is a recent Government initiative intended to make real benefits available, over the lifetime of the plant, to investors in alternative fuels. The knock on effect of this (if its availability is not curtailed) would be to conceivably make any or all of the communal plant rooms in Tower Hamlets a profit making concern. Tower Hamlets has a number of communal systems, anyone of which, if converted, could contribute significantly to Tower Hamlets income, its residents and help to reduce fuel poverty and Carbon emissions.

Installation Comparison
Although some of the elements of the installation are common, e.g. radiators and pipe work, the positioning of the boilers for an individual system would mean less intrusion and time spent in dwelling under a communal system although the overall scheme time on site may well be longer.

Environmental Comparison.
It has long been this boroughs procedure to maintain communal heating systems as an energy conservation measure. Properly installed and controlled systems are expected to provide significant carbon saving in comparison to individual installations. The proposed Renewable Energy Enhanced system will provide not only measurable energy conservation measure, the $C.O^2$ reductions will help meet the councils $C.O^2$ reductions obligations, the individual system will add to THH and LBTH's Carbon foot print.

Aesthetic Comparison
External: Both systems would have an effect on the profile of the block.
The communal system requires new pipework from the boiler house to the dwellings in order to accommodate the new distribution system. The new risers will be run externally in the rear courtyard area of the block however they will be enclosed in cladding coloured to match the colour of the block.
Individual boilers require individual flueing and will result in a number of unsightly condense producing additions (pluming) to the front and side elevations to the block.
Internal: Both systems will produce more pipework runs and we would rely on the ingenuity of the engineer and installer to minimise the impact of these.
The Both communal and individual system will free up the internal cupboard space for the redundant hot water cylinder, but the individual would need to accommodate the new boiler in the kitchens depriving residents of cupboard space. The Individual system will require a new galvanised steel gas service to which would be installed on the front elevation of the building.

Impact on residents
Communal System: This could include additional energy saving measures regarding the control configuration and setting including operation temperature and parameters and running times. Major savings can be made in adjusting the control settings of the majority of communal systems. But before this could be carried out a corporate policy would need to be agreed at management or board level. Residents will need to be involved in the process. Resident need to fully informed of the implication of the way the communal system are operated so they can make an educated decision on how their heating system is to operate including the cost implication and environmental implications.
Individual system: This would clearly offer flexibility of use and immediate proportional charging. It would also mean a substantial number of residents having to enter into new Gas supply agreements and additional bill and parental fuel poverty for some resident, note the current average Gas rate are 6.5p kW/h LBTH obtain a commercial rate of around 3p kW/h. A large capital investment to provide a new gas service to the block would be required.

Recommendation
As can be seen from the above even if grant funding is not obtained over a twenty year period the cost to install individual systems is grater then communal and the cost of the new Gas service would be excessive. We also need to consider and reduced impact of the improvements for residents cost and the environment issues of the communal system. It is with that in mind that **Option1 Communal system** is recommended for adoption.