REVIEW OF MEAKIN ESTATE

HEATING AND HOT WATER SERVICES

at:

MEAKIN ESTATE
DECIMA STREET
LONDON SE1

for:

LEATHER MARKET JMB
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REPORT REVISIONS RECORD

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1. INTRODUCTION

David Miles and Partners Limited (DMP) have been commissioned to provide a non-intrusive report on the heating and hot water communal services installed on the Meakin Estate.

The report is to cover the following:

- Whether the new system installed in 2017 by Invicta Building Services is fit for purpose.
- To provide running costs comparison with old system, new system and similar systems under the control of the JMB.
- To provide an in-depth look at system breakdowns and loss of service since the installation was installed including reasons and resolution.
- Whether the new system has been correctly maintained by the term maintenance contractor OCO heating limited.
- Analysis the current procedures for attending emergency call outs and make recommendations for improving the current service to the residents of the estate.

1.1 LIMITATIONS OF THE SURVEY AND REPORT

Site inspections were carried out both jointly and in attendance with JMB and OCO Engineers the findings of which will be included in this report.

Correspondence from all parties and communication were available was analysed and taken into account outlining issues with communication failures between all parties.

A lesson learned approach has also been adopted and recommendations made to include improving service delivery to the residents and client.

Tables produced were based on data received from the client.

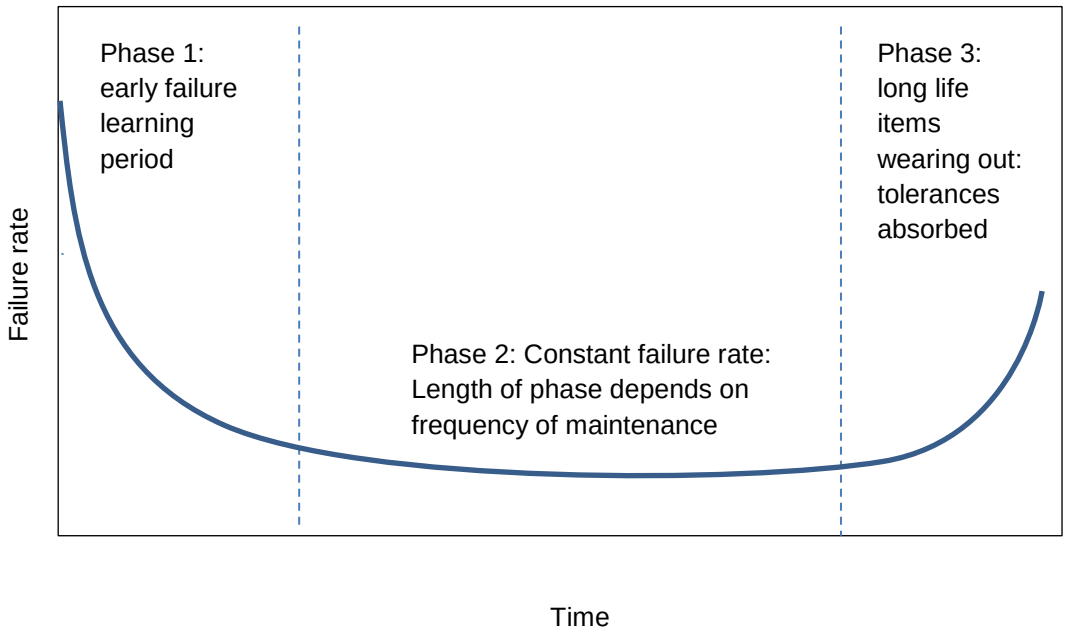
Onsite inspections/investigations of plant rooms and plant were carried out by Tony Baker Senior Project and Compliance Engineer (DMP) and Colin Smith Project Engineer (DMP)

2. SYSTEM INSTALATION

The heating and hot water system on Meakin Estate was fully refurbished in 2017-18 by Invicta Building Services. The existing Medium Temperature Hot Water (MTHW) system was approx. 35-40 years of age, did not comply with the current building regulations had inadequate controls, in poor condition and was inefficient. The system had exceeded its recommended maintainable and cost effective life expectancy as outlined in the CIBSE guidelines in the CIBSE Maintenance and Engineering Management “M” document.

This can also demonstrated in a simple bath chart indicative of required maintenance for any mechanical systems taken from CIBSE Maintenance Engineering and Management Guide M document.

BATH GRAPH OF INDICATIVE MAINTENANCE REQUIREMENTS



Phase 1: Decreasing Failure Rate: This occurs when the system is new and is a consequence of teething problems such as design and installation errors, faulty components and manufacturing faults among other matters.

Phase 2: Constant Failure Rate: In maintained systems, after the early failure period, the system will be in settled state, random isolated faults and failures will occur, and parts that wear will need repair and/or replacement from time to time as part of preventative maintenance. Such parts typically include bearings, seals, printed circuit boards, control components, motors, heat exchanger components and compressors on packaged heat pumps/air conditioners or multiple compressor chillers.

Phase 3: Increasing Failure Rate: This is the point where major components begin to fail and random failures increase with time. At this stage the cost of repair of plant and equipment begins to exceed the cost of replacement.

The new system was designed to incorporate all the current building regulations include building regulation “L” which emphasises on energy efficiency and follows hand in hand with the governments guidelines in trying to reduce the countries carbon footprint.

The new system also took into account that the existing MTHW system in certain conditions could cause a possible health and safety situation i.e. lack of local and overall control of temperatures entering the dwellings of temperatures of 100C and above.

The new system installed is a low temperature hot water system (LTHW) i.e. operating temperatures lower than 100C with a high limit shut off safety set at 95C in the main plant room.

The LTHW system has been sized correctly to produce the heating and hot water demand requirements for the communal system. This includes the boilers, pumps, radiators and control valves.

Additionally and in accordance with the current building regulations the system incorporates outside weather compensation sensors to enable heating on demand within the dwellings when required i.e. when the outside air temperatures are below the set point, usually 17-18C which will enable the satellite plant rooms to gradually bring back the heating services to the dwellings on a linear scale.

The new system also now incorporates local controls within the dwellings via a fully programmable room thermostat controlling individual two port motorised valves with by-pass and thermostatic radiator valves fitted for localised room air temperatures.

The hot water within the bathroom areas are fitted with thermostatic mixing valves (TMV's) as an additional safety measure to prevent scalding.

The existing four satellite plant rooms on the estate were originally located on the 1st floors within the blocks which proved cumbersome for maintenance purposes and risked flooding the ground floor dwellings when planned preventative maintenance (PPM) was being carried out within.

The design of the new system has allowed for the relocation of the existing satellite plant rooms to be moved to the redundant rubbish rooms directly below the existing. This will eliminate the possibility of ground floor dwellings being affected during PPM schedules.

The two existing primary heating pumps in the main plant room were reused in the new heating design as they were in good working condition and recently installed.

The pumps were fully overhauled by IBS before being reinstated on the new system and were given a new warranty period of 12 months from practical completion date.

It is also noted that be reusing these pumps would save the client approx. £30K from the installation costs of the new system.

All modern materials have been used in the installation of the new heating system which include a leak detection system on the buried heating primary mains which have a 5 year warranty

The secondary distribution pipework which runs within the ducts and roof space has a 50 year warranty from the manufacturer.

The new system was maintained during the first 12 months defects liability period (DLP) by Invicta Buildings Services (IIBS) which performed as designed during commissioning stage.

It is also to be noted that should a failure to the plant within any of the satellite plant rooms occur that the new equipment within has the function to be set into manual/maintenance setting which enables the services to be provided to the residents on a temporary basis until a full repair can be carried out. This also allows the plant to be worked on in most situations during PPM without disrupting the service.

The system was handed over to the maintenance term contractor OCO heating on 20th June 2018.

2.1 SYSTEM BREAKDOWN ANDLOSS OF SERVICE LOG FOR ESTATE

2.1.1 Plant room 3 HWS Pump:

Date: November 2018 Cause: HWS pump mechanical seal had split

Impact: Loss of HWS to block supplied by plant room three.

Remedial Action: HWS pump was replaced with new and spare pump kept in main plant room.

2.1.2 Plant Room 1 heating valve:

Date: November 2018 Cause: Water from leak on flange had dripped into valve actuator.

Impact: Loss of heating to block supplied by plant room 1

Remedial Action: System was put into manual to restore services until replacement actuator for heating valve.

2.1.3 Flue Dilution Fan (FDU) main plant room.

Date: January 2019 Cause: Belt driving fan motor broken;

Impact: Total loss of service due to planet room fail safe.

Remedial Action: Replaced belt service restored;

2.1.4 Power outage main plant room:

Date: January 2019 Cause: EDF power loss to main plant room, system failed safe.

Impact: Whole estate loss of heating and hot water services as the system had failed safe.

Remedial Action: Once power restored by EDF reset plant room controls and restored services.

2.1.5 Primary Heating Pump main plant room.

Date: January 2019 Cause; Main bearings worn on pump motor.

Impact: Loss of heating and hot water to whole estate.

Remedial Action: Changed over to standby pump No.2 to restore service, removed and repaired bearings Pump No.1 and reinstalled in main plant room.

2.1.6 Loss of system pressure main plant room;

Date: February 2019 Cause: The whole primary system in the main plant room was lost indicating a major leak on the system somewhere.

Impact: Whole estate loss of heating and hot water services as the system had failed safe.

Remedial Actions: Checked buried mains leak detection, no faults, Checked all visible distribution pipe work and plant rooms no leaks found. Re-pressurised system reset and restored heating and hot water services. System pressure holding indicating no leaks on system.

2.1.7 FDU main Plant Room:

Date: April 2019 Cause: Motor burnt out due to electrical fault on incoming supply.

Impact: Total loss of service due to plant room fail safe.

Remedial action: Repair fault on in coming electrical supply, renew FDU motor return to service, rewind existing fan motor return to site keep as spare.

2.1.8 Plant room 4 HWS pump:

Date: May/June 2019 Cause: HWS pump mechanical seal had split and leaked into control panel and heating valve

Impact: Loss of HWS and heating to block supplied by plant room 4.

Remedial Action: HWS pump was replaced with spare, repaired and placed in main plant room as spare, system was put into manual to restore services until replacement actuator for heating valve and attendance of controls specialist for main control panel.

3. DMP INVESTIGATION AND FINDINGS INTO SYSTEM BREAKDOWN

3.1.1 Incident 2.1.1 and 2.1.2 Plant Room 3 HWS pump. DMP Investigation

The HWS pump had developed a leak on the mechanical seal on the pump shaft. OCO had been aware of the leaking pump as a note had been attached stating reported back to their main office. However this had not been reported back to either the JMB or DMP advising them of the situation. The pump had **not** been isolated and had been left leaking. DMP only discovered this during their own routine site inspection on 28th January. The date on the note had indicated that the pump had been left like this leaking for almost a month which was now very serious.

OCO were instructed to immediately source a new pump in the plant room which they did the following day. The old pump was also replaced and kept as spare in the main plant room. However it has taken OCO five months to provide a spare pump to put in the main plant room. This has since been taken up with OCO's senior management which is in more detail further on in this report.

DMP also discovered during this site inspection that the heating actuator in plant room 1 (Refer to 2.1.2) had been disconnected from the motorised valve and left in manual position. This had also not been reported back to the JMB or DMP.

Additional measures were taken against OCO over this incident which included removing off the responsible maintenance engineer from the JMB area and crediting back a months' worth of maintenance cost to the jmb via a credit note of £855.00

3.1.2 Incident 2.1.3 and 2.1.7 FDU. DMP Investigation.

There were two separate incidents involving the FDU one was the fan belt breaking on the motor. This is a consumable item which could snap at any time due to normal wear and tear on a piece of plant which operates 24/7. Spare belts are stored in the main plant room.

The FDU is an integral piece of equipment which must be in operation for the boilers to operate. If is not working the system will fail to safe. Once the belt was renewed on the motor the system was restored.

The only delay was due to the fan being on the roof of the plant room covered in an acoustic shroud to dampen any noise pollution to the nearby new building which has been built in very close proximity to the existing plant room. This required two operatives to remove the shrouding.

It was noted during the installation of the new system in the defects liability period that environmental heath gave instruction to retrofit the acoustic shroud and attenuators to alleviate noise issues.

It may be a possibility that this may be causing the fan motor belt to overheated and become brittle. This is being looked at further to add more ventilation grills to keep the unit cooler.

The second incident was different as the wirings on the fan motor failed and the fault was diagnosed as being on the EDF supply wiring being loose in the main distribution board. This fault is deemed outside of the maintenance contractors remit.

The wiring on the EDF supply was rectified, a new fan motor was installed and system restored to service. The faulty fan motor was removed and returned to site in the main plant room to be used as spare in case of similar scenario should arise in future as a lesson learned.

Although it cannot be proven it is DMP opinion that the EDF fault may have also contributed in the fault on the Primary Heating pump in refer 2.1.5.

3.1.3 Incident 2.1.4. Power Outage DMP Investigation

There was an EDF power outage that caused to main emergency gas valve in the main plant room to fail safe. This is a mandatory health and safety requirement built into the design of the system. OCO engineer attend and once power was restored manually reset the emergency gas valve and rest of plant equipment and restored heating and hot water services to the estate.

3.1.4 Incident 2.1.5 Primary Heating Pump main plant room DMP investigation.

No1 primary heating pump in the main plant room developed a fault on the motor bearings. Note these pumps are the existing main pumps in the plant room that we reused to save costs. The system incorporates a standby pump (No.2) this pump should have automatically come on when No.1 pump failed. However due to a wiring fault on the BMS this did not happen. DMP visited site with OCO to investigate, OCO were instructed to change over to No.2 pump manually and restore service to the estate, remove No.1 pump, repair and reinstate on completion.

Meanwhile the wiring fault on the BMS was referred back to the installer (IBS) as a latent defect. IBS promptly attended and repaired wiring issue at nil costs. System is now back on fully automated control.

There was a slight delay in restoring the service which could have been avoided due to OCO not being proactive in putting the standby pump on manually.

3.1.5 Incident 2.1.6 Loss of system pressure main Plant Room DMP Investigation

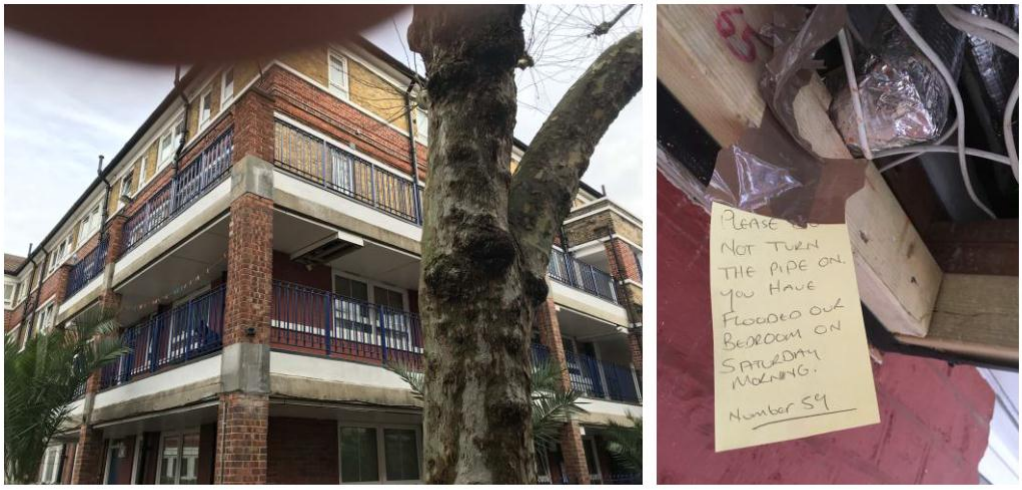
This particular incident occurred back in February 2019. OCO reported that the system Primary pressure had been lost in the main plant room which caused the boilers to shut down safe which in turn caused a complete loss of service to the whole estate.

It is noted that when this happens that a large leak has occurred somewhere on the primary or secondary heating circuit only as the HWS circuit is separated by the plate heat exchanger units within the satellite plant rooms.

However when OCO and DMP visited we found no leaks being indicated on the buried mains leak detector, no signs of leaks in any of the 4 plant rooms and no visible signs of water leaking from the above ground distribution mains.

We re-pressurised the system which held and showed no loss of pressure, reset the boilers and restored all heating and hot water services to the estate,

During our site visit we noted that a panel was missing on one of the blocks and on closer investigation found a note from No.59 requesting that the leaseholder in No.65 “do not turn on the valves again” because they have flooded them out over the weekend” See attached photo taken at the time of our visit.



No. 65 Meakin

This suggests that the leaseholder in No. 65 has been carrying out some works within the dwelling to the heating system which may have caused the pressure loss on the system.

Note also that the system has not lost its pressure since this incident as far as we are aware. If the works carried out in Flat No.65 were not related to the pressure loss on the system we are unable to determine the real reason.

3.1.6 <u>Incident 2.1.8 Plant Room 4 HWS Pump. DMP investigation</u>

The HWS pump in plant room No.4 had developed a leak on the mechanical seal. However it was reported that the water had got into the main control panel. DMP attended site to find that an OCO engineer was installing the spare pump into the satellite plant room and was drying out the installation. OCO was also instructed to repair the faulty HWS pump and return it to main plant room for future spare.

The following day the JMB were still receiving reports of no HWS for this plant room so DMP revisited site and found the following:

None of the plant was running although the main control panel had power, was set in auto mode and the plant room was dry.

DMP put the control panel into manual setting and the hot water service was restored and all appeared to be working. We reported this back to the JMB office and requested an update from OCO including why the system was left off.

OCO later reported that the main control panel had had water damage and that their controls specialist was required to fix the fault. OCO were instructed to get this arranged.

However the JMB were getting complaints of no heating from this block during the colder times of the day i.e. when the outside air temperatures were going below the programmed set point of 17-18C

OCO returned to site and reported back that the actuator on the heating valve had also received water damage and was not working. OCO were instructed to remove actuator and put into a manual setting until a new actuator could be installed. This was eventually done by OCO and heating was restored to the block.

It must be pointed out at this point the following:

1. A delay has been caused by OCO in not providing a controls specialist promptly and only after constant chasing by DMP and the JMB is there control specialist visiting site to make the necessary repairs to the control panel i.e. three weeks after the initial incident.

2. A delay in restoring the service to the residents has been caused by OCO in not putting the system into the manual setting as the new system has been designed for in the case of emergencies such as this.

3. A delay has been caused by OCO in not following out verbal instructions given by the contract administrator and causing a loss of available service to the residents of this block for at least a week.

4. Why did it take OCO a week after the initial incident to diagnose that the actuator on the heating valve had also suffered water damage.

5. DMP's opinion that the water damage inside the control panel was caused by the panel not being closed correctly and left partially open. However this cannot be proved at the time of the incident but have found panels left partially open within some of the plant rooms.

3.1.7 GENERAL INVESTIGATION DMP COMMENTS

For the 8 incidents investigated above which incurred loss of service to either the whole estate or partial loss via a block, 2-3 of the 8 were faults outside of the JMB or maintenance contractors control i.e. power loss and EDF fault on the main distribution network. This could have happened on any system new or old.

The loss of pressure to the system is deemed to have been possibly caused by works carried out by the leaseholder in flat No. 65 and this is being investigated by the JMB directly.

The belt on the FDU unit breaking is a maintainable item no different from a fan belt on a car.

The Actuators on the heating valves are again a maintainable item and will need to be renewed due to normal wear and tear. However the two in question have been damaged due to a water leak which may have been picked up earlier by the maintenance contractor as part of their checks.

What is disturbing is the failure of the mechanical seals on the HWS pumps which would not normally be failing within this time period and should be investigated further with the manufacturer.

The table below indicates the availability of the system taking into account the above faults. Refer to Table No.1 below. It is DMP opinion that the down time could have been reduced drastically if the term contractor had put the system into manual setting at the time of their initial visit and which would have increased the availability to approx. **97.5%** refer to Table No.2

Down Time Meakin estate				
Fault	Days		Percentage not available	Availability
FDU	8			
Press Loss	1			
Power loss	1			
Actuator	1			
HWS pumps	7			
Primary Pump	2			
Total	20	365	5.40%	94.60%

Table No.1 Availability of Meakin Estate Heating and Hot Water Services

Down Time Meakin estate				
	Days			
FDU	5			
Press Loss	1			
Power loss	1			
Actuator	1			
HWS pumps	1			Possible
Primary Pump	1			Availability
Total	10	365	2.74%	97.26%

Table No2 Possible Availability if Placed in Manual Control

This has since been taken up with OCO;s director and Senior Management via a recent meeting with the JMB Management and DMP representatives who have given OCO a deadline of 1 month to improve their performance immensely. Failing to do so will trigger a procedure for them to be removed from the maintenance contract on the communal side and the maintenance will be transferred to another contractor until the contract can be retendered and be ready for in 2020.

This was compared to London Borough of Southwark's availability for their communal heating systems which they confirmed to be **96.89%** for the year 2018/19 across the borough.

It is also to be noted that the new system installed on the Meakin incorporates the "heating on demand" facility (HOD). Whereas the old system was shut off during the summer months. Usually May to October (5) months of the year and therefore heating within the dwellings was not available at all during these months. This can be demonstrated in Table No.3 below.

This indicates that the old system had **41.67%** less availability than the new system.

HOD comparison				
Old	New			
Months	Months		Availability	
7	12	58.33%	41.67%	Less

Table No.3 HOD Comparison to Old System Meakin Estate.

DMP during their investigations have also observed fallings in communication from OCO back to the JMB/DMP and residents in particular during out of normal office. This we can fully appreciate the on-going frustration with the client and its residents of not knowing what is happening during incidents as those mentioned above which, also creates misinformation being sent back to the residents.

It is also apparent that OCO could have also diminished most of the service loss to the estate/blocks by putting the system into a manual control setting during their initial visits rather than having to be instructed to do so.

It has also been noted that OCO have delayed repairs by waiting for an official orders rather than being proactive and acting on verbal instruction given by the client and contract administrator who would raise retrospective follow on orders. This is the procedure in accordance with the maintenance contract and where OCO have been failing recently

3.1.8 COST AND PERFORMANCE COMPARISON NEW AND OLD SYSTEM

DMP were also requested to compare the performance via historic repairs history and running costs for the new system to the old system based on information provided by the client.

The data includes repair history charges from 2015-2019 which takes into account data before the new system was installed, including the previous maintenance contractor T Brown Group (TBG) and data after the new system was handed over to the current term maintenance contractor OCO. It includes planned maintenance costs, fuel costs, general repairs i.e. leaks and loss of heating and hot water services, monitoring and the annual RPI Uplifts. It does **not** include CWS water tanks, individual gas checks or faults unrelated to the heating or hot water system. It should also be noted that the repairs team and call centre would have raised more jobs than what is recorded here but many of these would relate to the same faults within the plant rooms. Therefore the following analysis is for the orders raised which incurred actual costs only. All other orders would be closed at nil value by the contractor. Refer to the table No.3 below:

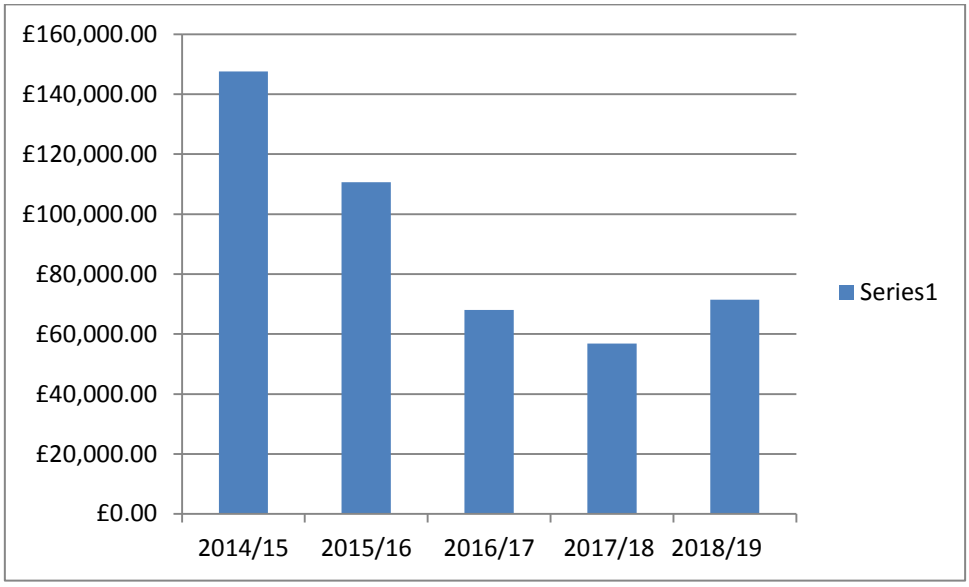
Comparison info			Costs	Difference as a percentage		
Meakin	Old system		£100,532.87			
	New System		£71,402.45			
	Difference		£29,130.42	71.02%	28.98%	Less

Table No.3 Comparison of New and Old System Meakin Estate Running Costs

The costs difference for the new system can also be demonstrated on the bar chart below which includes base data from 2014 to 2019.

- 2014-15 had a large repairs costs due to condition of plant and equipment and includes the full annual PPM costs at that time.
- 2015-16 again had a large repairs cost due to the failing plant but has a reduced PPM costs as the installer of the new system took control of the estate and this would have been covered in the installation contract.
- 2016-17 does not include the PPM costs as it is covered in the installation programme.

- 2017-18 Only includes a small sum for PPM costs as this was mostly covered under the defects liability period under the installation contract
- 2018-19 includes the full PPM costs as the new system is full handed over to the term maintenance contractor OCO and includes the annual RPI uplift.



Meakin Estate Running Costs Since 2014

DMP also makes note that out of the total number of repairs raised on the Meakin Estate since the system has been handed over to the maintenance contractor that **47** of these were reported back as no faults. These unnecessary visits incurred costs of **£1,901.85** and have been included in the data in table No.1 and the bar chart above. It is DMP's opinion that these were raised as a fault due to the residents not fully understanding how the new system worked.

DMP were also requested to run a comparison of running cost for another estate of a similar size i.e. Kipling estate and the same criteria as above. Kipling estate is also in the same age and condition as the Meakin estate prior to the new installation. See table No.4 below

Comparison	Kipling		£95,947.55	Diffence as percentage		
	Meakin		£71,402.45			
	Difference		£24,545.10	74.42%	25.58%	Less

Table No.4 Comparison Meakin Estate to Kipling Estate Running Costs

3.1.9 DMP FINDINGS ON RUNNING COSTS

As the base data information demonstrates there is a large cost difference prior to the new installation and the new one.

The running costs for the old system was 29% more the new system.

The PPM maintenance costs have risen over the last 3 years but can be attributed to the annual RPI increases which were already expected under the terms and conditions of the current maintenance contract with OCO and are included in the above comparison.

The fuel cost over these periods demonstrates a large difference in fuel consumption due the new modern system being more energy efficient which equates to a reduction of approx. 30% and includes fluctuations in gas prices.

The cost savings can be attributed to the new system being fully controlled and energy efficient whereas the old system had little or no controls and wasted a large amount of fuel.

The comparison taken against the Kipling Estate also shows equivalent results i.e. 25.5% cheaper to run and 23% less fuel consumption.

4. CONCLUSION

4.1 FIT FOR PURPOSE

Fit for purpose covers purpose of the item and given assurances to the satisfactory quality of the item. The item in question is the installation of the system installed by Invicta Building Services.

The principal of the replacement of the 'old' existing system was formerly agreed on the basis to reduce breakdowns and reduce energy consumption for the end user and client.

The report concludes, based on evidence provided, both these parameters have been met, reduced energy consumption and reduced breakdowns.

4.2 SYSTEM BREAKDOWNS

Having carried out an in-depth review of the system breakdown, the analysis provided has highlighted the reasoning for the 'call out' and breakdowns within the recommendations

4.3 TERM MAINTENANCE CONTRACTOR

The conclusion is that the term maintenance contractor (OCO) has not fully satisfied their requirements under the terms of the maintenance contract and requires further scrutiny.

4.4 EMERGENCY CALL OUT

The conclusion is that further improvements could be made to this area. Although generally the system set up is fine, some minor failings have occurred and review should be implemented.

5. RECOMMENDATIONS

5.1 FIT FOR PUPOSE SYSTEM

The system being fit for purpose, the recommendation four this report is that although this item is concluded DMP will continue to monitor the system.

5.2 SYSTEM BREAKDOWN

The following recommendations and actions should be reviewed and instigated.

- The JMB to emphasise again that it vital to all residents (including leaseholders) that under no circumstances should they carry out any works on the communal heating and hot water system. They should seek advice and permission from JMB and its technical advisors (DMP).

- The JMB may wish to re-issue again the user information to its residents for operating the programmable room thermostat within the dwellings, the operation of the thermostatic radiator valves and the outside weather compensation controls operating the four satellite plant rooms feed the blocks. Hopefully this will decrease the unnecessary orders and costs where there has been no fault on the system and just a user control issue

- DMP also have investigated further into the reasons for the new Stelrad HWS pumps mechanical seals failures in plant rooms 3 and 4. The Stelrad pumps are of the same specification as the existing system as they were renewed on a like for like basis to reduce costs. They operate on a 24/7 basis as they solely circulate the hot water supplying the dwellings from the satellite plant rooms. Leaking from the mechanical seal around the pump shaft although this is usually the first thing to leak under normal wear and tear conditions for this piece of equipment. However it is unusual for pumps of a relative recent install date to start leaking so soon.

- Therefore DMP will contact the manufacturer of the Stelrad pumps to investigate this further and provide some assurances of their pumps integrity.

- If after the meeting the outcome does not produce a satisfactory conclusion then we recommend using a different manufacturer when the pumps are next replaced i.e. Grundfos or equal or approved

5.3 TERM MAINTENANCE CONTRACTOR

The following recommendations and actions should be reviewed and instigated.

As instructed at the meeting held with OCO management and in addition to the meeting. These following bullet points have already been instructed and instigated by the JMB and Contract Administrator as Follows:

- The OCO call out engineer will call back to repairs teams/call centre once they have arrived on site.

- The OCO engineer will also update the repairs team/call centre when he is leaving site and let them know if the system has been restored or left safe and requiring further remedial actions.

- The OCO engineer where possible will put the system into a manual setting to restore the heating/hot water service to the residents.

- OCO will act on all verbal instructions given by the client or contract administrator (DMP). A follow on retrospective order will follow ASAP.

- OCO will not close down any order raised until the repair is fully complete and the system is put back to normal operating parameters. They can then apply for payment accordingly.

- Any unforeseen delay to complete the full repair must be immediately communicated to the client and DMP.

- OCO will ensure that all their specialist sub-contractors are readily available for emergency situations and have at least two back up sub-contractors i.e. controls specialist to fall back on.

- OCO is to read the O&M manual issued to them for the Meakin Estate and liaise with the manufactures and their own suppliers to ensure that any spares or replacement equipment equal or approved is readily available in case of future breakdown.

- OCO are to note the items of equipment which are still under warranty i.e. secondary and primary distribution mains and to liaise with the manufacture direct in the event of any failure ensuring that the contract administrator (DMP) is copied in at all times.

- DMP also recommend that they themselves be proactive and approach alternative contractors who will demonstrate an interest in taking over the communal side of the maintenance contract on a temporary basis i.e. until the contract is retendered in the event that OCO fails to meet the deadline set in improving their current performance.

- OCO to demonstrate that the system has been maintained in accordance with the manufacturer's installation and maintenance instructions and in accordance with the SFG 20 Document which is the industry standard guidelines for plant maintenance.

- If OCO cannot produce these records then it is recommended that they refund the PPM costs for this estate in full for the year 2018-19

- DMP also recommend that they increase their own site inspections to ensure that the contractor is fulfilling its responsibility in maintaining the plant equipment in accordance with the current contract.

- It is also to be noted that OCO performance lately has been unsatisfactory on the other communal systems under the JMB control and this is not just related to the Meakin Estate.

- If OCO continue to fail in the communal services area, we would recommend this service is provided by another contractor.

5.4 EMERGENCY CALL OUT

The following recommendations and actions should be reviewed and instigated.

A meeting should be arranged with the emergency call out service provider, JMB and OCO to review the process of logging calls, call outs and procedure for reporting back. To be reviewed on a quarterly basis.