

Volume 2
Document Number 6

MEASURED TERM CONTRACT

FOR

**HEATING AND WATER WORKS FOR RESIDENTIAL BUILDINGS IN THE
LONDON BOROUGH OF SOUTHWARK**

(‘THE WORKS’)

TECHNICAL SPECIFICATION

Planned Maintenance Tasks

11.01 The following schedules of tasks shall be applied where appropriate to each district heating system installation. Tasks with a frequency other than daily shall be programmed to be undertaken during Normal Working Hours and Normal Working days.

11.02 The maintenance frequency required is abbreviated as:

<u>Notation</u>	<u>Frequency</u>	<u>Days between checks</u>
D	DAILY, every day	1
W	WEEKLY, every week	7
2W	FORTNIGHTLY, every 2 weeks	14
M	MONTHLY, every 4 weeks	30
Q	QUARTERLY, every 13 weeks	90
6M	SIX MONTHLY, every 26 weeks	180
A	ANNUALLY, every 52 weeks	365

11.03 The above periods will be applicable from the commencement date of the Contract.

11.04 The Council has grouped District boiler houses and plant rooms into set categories which the Tenderers shall price in Document 8 - Annex N (PPM). Appendix ‘L’ details the District boiler house and plant room types in the Contract areas. Each rate details the individual type and quantity of assets to be maintained and serviced by the frequencies listed above.

The categories are as follows:

Category	Description	Unit	Tasks
A	Medium Temperature Hot Water (MTHW) boiler	Per Boiler House	Carry out tasks to individual assets as identified in

	house.		Appendix 'L' and fully described in the Technical Specification and Planned Maintenance Tasks. The frequencies are detailed in Appendix 'L' and below.
B	Low Temperature Hot Water (LTHW) boiler houses with an individual boiler output not exceeding 2 Mega Watt.	Per Boiler House	
C	LTHW boiler houses with an individual boiler output exceeding 1 Mega Watt but not exceeding 2 Mega Watt.	Per Boiler House	
D	LTHW boiler houses with an individual boiler output exceeding 0.5 Mega Watt but not exceeding 1 Mega Watt.	Per Boiler House	
E	LTHW boiler houses with an individual boiler output not exceeding 0.5 Mega Watt.	Per Boiler House	
Category	Description	Unit	Tasks
F	Electrical Periodic Installation Testing to be carried out as per the Preliminaries (paragraph 38)	Per Boiler House/ Plant Room.	The Contract Administrator will issue an instruction nominating the specialist contractor to carry out these Works.
G	MTHW large plant rooms as identified in Appendix 'L'	Per Plant Room	Carry out tasks to individual assets as identified in Appendix 'L' and fully described in the Technical Specification and Planned Maintenance Tasks. The frequencies are detailed in Appendix 'L' and below.
H	MTHW small plant rooms as identified in Appendix 'L'	Per Plant Room	
J	LTHW plant rooms as identified in Appendix 'L'	Per Plant Room	
K	Booster pump rooms as identified in Appendix 'L'	Per Plant Room	
L	Sewage pump rooms as identified in Appendix 'L'	Per Plant Room	

11.05 The schedules of tasks have a frequency detailed against each task below:

PLANNED MAINTENANCE TASKS

FREQUENCY

TASK BOILERS (including gas fired water heaters)

MTHW

LTHW

B1. Prepare all boilers for annual inspection i.e. take off line, allow cooling down, removing casings, drain down, remove all manhole covers,

(A)

(A).

drain plugs, inspection plugs, so that water side of boilers may be inspected. Wash through boiler to remove all loose scale and sludge in accordance with the Technical Specification item 7.07

- | | | | |
|--------------|--|------|------|
| B2. | Carry out annual service to all direct fired water heaters | (A) | (A) |
| B3. | After inspection, renew all seals to smoke and water side, re-joint as necessary, replace boiler front bricks, refill boiler, warm through for 24 hours, check for leaks, secure and tighten all plates, fittings, rebox and put back on line. Ensure satisfactory seals on completion | (A) | (A) |
| B4. | Annually, check correct operation of boiler safety valve. Ensure valve is correctly seated following test. | (A) | (A) |
| Note: | Safety Valves 35mm (1 1/2inch) and under to be replaced every five years 50mm (2inch) and over to be prepared for insurance inspection and re-calibrated if required | | |
| B5. | Annually, open all smoke side doors and thoroughly clean smoke tubes and passages and remove all deposits back to bare metal. Inspect refractory brickwork and tube ends, reinstate service. | (6M) | (6M) |
| Note: | Oil – not to be carried out as a PPM task but will be raised as a separate Order if required. | | |
| B6. | Check flow and return temperatures, altitude gauges for correct operation. | (6M) | (6M) |
| B7. | Inspect for signs of leakage and service where necessary all boiler mountings including the three-way expansion valves, gauge connections and door seals. | (6M) | (6M) |
| B8. | Check operation of drain cocks | (6M) | (6M) |
| B9. | Inspect and clean in accordance with the manufacturers instructions all direct fired water heaters. | (6M) | (6M) |

Note: Requirements for boiler cleaning are detailed in paragraph 7.07 of this Specification. All defects are to be immediately reported to the Contract Administrator. The Contractor will also be required, within two normal working days to provide a fully detailed written report, including estimated costs, to the Contract Administrator.

- | TASK BURNERS | | MTHW | LTHW |
|---------------------|---|-------------|-------------|
| BN.1 | Completely overhaul and clean all parts of the burner, examine for distortion and damage etc. Check all gas pipework. | (A) | (A) |

Note: This task must be carried out in conjunction with BN2 and BN3.

BN.2 Carry out full combustion check on on-line boilers and reset for optimum efficiency (Dual firing – where gas is primary fuel, burner should be set up on gas and trimmed back for oil.)
The test on fully modulating burners is to be carried out across the burners full range. Check and test operation of motorised flue dampers and adjust as necessary including all interlocks. Service flue dilution, force draught and induced draught fans and prove electrical interlinking with burners.

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|--------------------|-----|------|
| (a) Forced Draught | (M) | (Q) |
| (b) Atmospheric | | (Q) |
| (c) Fanned Flue | | (6M) |

Note: This task must be carried out in conjunction with BN3.

BN.3 Check the following:-

- | | | |
|---|-----|------|
| (1) Flame failure control | (M) | (6M) |
| (2) Burner cover or door shut down switches. | (Q) | (6M) |
| (3) Sequence of burner controls i.e. purge, ignition etc. | (M) | (6M) |
| (4) Combustion conditions on low and high fire together with the mid position on fully modulating burners. Provide Flue Gas Analyser (FGA) reading detailing efficiency, flue gas temperature, levels of CO ₂ , CO and oxygen and ambient air temperature. | | |
| (a) Forced Draught | (M) | (Q) |
| (b) Atmospheric | | (Q) |
| (c) Fanned flue | | (6M) |
| (5) High and low flame operations. | (M) | (6M) |
| (6) Condition of flame. | (M) | (6M) |
| (7) Rotary cups - examine and clean | | |

Note: A copy of each reading is to be retained on-site in the Contractor's log book.

Note Oil – not to be carried out as a PPM task but will be raised as a separate Order if required.

BN.4 Carry out short term test check change of fuel on dual-fuel installations, check connections, repair or renew as necessary.	(Q)	(6M)
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BN.5 The following items are to be checked for satisfactory condition and function and, where necessary, the

equipment is to be reset and recalibrated to achieve correct operation.

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|----------------------------|-----|------|
| (a) Forced Draught | (M) | (Q) |
| (b) Atmospheric | | (Q) |
| (c) Fanned Flue | | (6M) |
| (1) Control thermostat. | | |
| (2) Over temperature stat. | | |

Note: When operated this stat must, in the interests of safety, remain in that position until reset.

- (3) High and low limit stat.
- (4) All temperature and pressure gauges.
- (5) Fan failure controls to lock out boiler.

Note The Contractor will be required to respond immediately to a request from the Contract Administrator to change to oil firing on installations using gas under an interruptible tariff.

Note For installations with a dual-fuel capability the maintenance programme must take into account the use of either fuel which will be selected as required by the Employer.

TASK GAS BOOSTERS	MTHW	LTHW
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|--|-----|-----|
| GB.1 Check shaft couplings, pulleys and belts for condition and correct alignment/tension. Check guards and fittings secure correct and repair as necessary. | (M) | (Q) |
|--|-----|-----|

TASK CHIMNEYS	MTHW	LTHW
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- | | | |
|---|-----|-----|
| CH.1 Clean all flue ways on all boilers up to and including the entry to the main vertical flue. Report on condition of flues. | (A) | (A) |
| CH.2 Check and service all draught stabilisers and explosion doors. | (A) | (A) |
| CH.3 Check operation of flue dilution, force draught and induced draught fans. | (A) | (A) |
| CH.4 Clean and carry out internal inspection of liners and brickwork. Carry out external inspection. Report on condition, make recommendations for repairs. | (A) | (A) |
| CH.5 Inspect lightning conductors for security and continuity. | (A) | (A) |

Note: Chimney inspections must be carried out by an approved

specialist Contractor.

TASK FEED AND EXPANSION TANKS		MTHW	LTHW
ET.1	Drain and clean out, renew valve washer, check condition of tank, clean tank space. Check and service as necessary the water supply meter.	(A)	(A)
ET.2	Check correction operation of float and valve.	(A)	(A)
TASK FUEL TANKS AND LINES		MTHW	LTHW
Note:	These tasks will only apply to boiler houses with Dual Fuel burners		
FT.1	Check for oil leaks; secure where possible by tightening joints, glands, etc.	(6M)	(6M)
FT.2	Check fuel tank contents indicator for correct operation and reading	(6M)	(6M)
FT.3	Clean and check all oil filters, including final filters for burners (when oil firing).	(6M)	(6M)
FT.5	Check and maintain tank space lighting and door closures. Replace lamps where necessary.	(6M)	(6M)
FT.6	Operate drain valve and check tank for sludge and water.	(6M)	(6M)
FT.7	Check indicated tank levels, notify delivery requirements and receive deliveries as necessary		
Note	Oil – not to be carried out as a PPM task but will be raised as a separate Order if required.		
FT.8	When oil is not in use but pumped ring main is available, run for a period of four hours, where this is not carried out automatically, to prevent stratification of fuel	(6M)	(6M)
TASK CALORIFIERS/ANGELERYS/PLATE HEAT EXCHANGERS		MTHW	LTHW
CA.1	Isolate, drain down and open up vessels for annual cleaning and insurance inspection or where the desired recovery rate cannot be maintained; report any defects.	(A)	(A)
	Carry out acid clean of vessels and tube bundles using a solution of hydrochloric acid (or other as appropriate to the materials of construction). Remove all loose scale and sludge. Thoroughly clean out calorifier/Angellery/plate heat exchanger		

removing all traces of acid solution.
calorifier bundles and Angellery tubes shall be removed,
transported, pickled in acid solution and replaced and
shall not be cleaned in situ.

After inspection or carrying out clean, box up re-jointing
as necessary. Refill and check for leaks.

CA.2	Check condition of insulation and report any defects to Contract Administrator.	(6M)	(6M)
CA.3	Drain and clean out, chlorinate and check condition of storage calorifiers. The chlorination regime shall be as for cold water tanks (CW.2) and appropriate certification provided.	(6M)	(6M)

Note: Where calorifier and Angellerys are installed in tandem, one should be left operational to maintain service.

TASK	PUMPS (including those associated with Pressure Vessels)	MTHW	LTHW
P.1	Take off line and thoroughly check condition for correct operation, replace belts (if required), repack glands and adjust correctly. A return visit is to be made after about two weeks running to re-adjust.	(A)	(A)
P.2	Inspect shaft couplings for condition and alignment. Correct and repair as necessary.	(A)	(A)
P.3	Inspect pulleys and belts for condition, tension and alignment. Check and grease bearings correct and repair as necessary.	(6M)	(6M)
Note: Replacement belts shall be considered consumable items included within the PPM.			
P.4	Spanner check all nuts and bolts.	(6M)	(6M)
P.5	Check sump pump operation and ensure sump clean.	(6M)	(6M)
P.6	Check condition and operation of sewer station pumps.	(A)	(A)
P.7	Change duty of pump where automatic changeover is not performed including potable water pumps.	(Q)	(6M)
P.8	Check suction and discharge pressures where gauges fitted.	(Q)	(6m)
P.9	Visual checks for leaks; secure where possible by tightening and or repacking joints, etc.	(Q)	(6M)
P.10	Check condition of anti-vibration mountings, bellows and couplings.	(Q)	(6m)

TASK COLD WATER DOWN SERVICE TANKS	MTHW	LTHW
CW.1 Check overflows, correct operation of float and valve all in accordance with the current Water Regulations.	(A)	(A)
CW.2 Drain and clean out, chlorinate, check condition of tank, covers and access hatches, renew valve washer, clean tank space, provide test certificate. Check condition of joints in sectional tanks.	(A)	(A)
<p>The chlorination regime shall be as follows:</p> <p>Refill with fresh water and chlorinate with 50mg/litre (ppm) free residual chlorine for one hour; drain and flush until no chlorine can be detected above the level of the incoming mains supply. Note. Check if procedure is still correct.</p> <p>The test certificate shall include a statement of the chlorine concentration at beginning, during and at the end of testing.</p>		
TASK UNDERGROUND MAINS	MTHW	LTHW
M.1 Examine all underground mains pits, pipe ducts and Conduit ends and make sure conduit vent is clear. Lift pits and duct covers, examine and clean covers, grease and renew joint to covers. Pump out pit or duct if required. Examine all expansion bellows and associated anchors - check and adjust alignment, ensure hot and cold movement is clear. Check all valves for freeness of operation and leaks, secure and adjust, wire brush, clean and repaint (Hammerite or equal). Check hangers, rollers and insulation and report (manually operated valves). Clean and overhaul valve glands and repack as necessary.	(A)	(A)
TASK DISTRIBUTION MAINS	MTHW	LTHW
DM.1 Examine all expansion bellows and associated anchors - check and adjust alignment, ensure hot and cold movement is clear. Check all valves for freeness of operation and leaks, secure and adjust.	(A)	(A)
DM.2 Remove filters in primary and secondary mains, clean, replace and re-joint, inclusive of all necessary works.		
(a) Up to 50 mm	(A)	(A)
(b) 50 mm and over	(A)	(A)

DM.4	Visually inspect all pipework and fittings and provide a detailed report on the condition of pipework, fittings and thermal insulation together with recommendations and budget costs for any necessary repairs and/or improvements	(A)	(A)
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TASK CONTROLS & PROTECTION

MTHW

LTHW

The following items are to be checked for satisfactory condition and function and, where necessary, the equipment is to be reset and recalibrated to achieve correct operation.

CP.1	Boilers, calorifiers and other Heat Exchangers and all other Heating or Hot Water Devices		
	(a) Temperature control valves.	(2W)	(Q)
	(b) All temperature (when on line) and pressure gauges.	(6M)	(6M)
	(d) High limit thermostats/controls on heating & hot water services	(2W)	(Q)
CP.2	High Lift Water Pumps	(6M)	(6M)
	(a) All controls such as:-		
	(i) Second pump cut in.		
	(ii) Low supply water level.		
	(iii) Pump main pressure control.		

TASK BUILDING ENERGY MANAGEMENT SYSTEM (BEMS)

MTHW

LTHW

BM.1	Energy Management System Outstation	(6M)	(6M)
	Make visual check that manual override switches within UC8000 are in authorised position, sensors and cables are properly linked, BT line connected AND panels are left securely locked. Carry out function check on door switch by reference to point status using UC8000 display. The UC8000 is being replaced over a programme of work.		
BM.2	Building Energy Management System (Trend IQ)	(6M)	(6M)
	(a) Check conditions of all field devices and panel; pumps, sensors, boilers, DPS, pressurisation unit, Etc..		
	(b) Connect to controller, take back up of software		
	(c) Check temperature readings,		
	(d) Check pump DPS', flow status'		
	(e) Check pump enables, Check boiler enables		
	(f) Check function of actuator, control to correct set points		

- (g) Check strategy is functional correctly. Record controller functions, hot water service software, heating software.
- (h) Check condition of cables, check termination and tighten is req.
- (i) Check communications line/phone line

TASK ELECTRICAL SERVICES	MTHW	LTHW
E.1 Visually check all boiler room, calorifier room, tank room and pump room electrical equipment lighting and wiring for correct operating conditions, earthing, insulation, etc. This is to include all aspects such as flexible conduits, fuse ratings, overload settings and operation, secure fixing of junction boxes, terminals and ferrals, and condition of switch doors, etc. Electrical installations are to be tested in accordance with the IEE Regulations and appropriate certificates are to be issued to the Contract Administrator where instructed. On all three phase installations tests are to include for phase in balance. Clean out panels with vacuum. Provide written report to the Contract Administrator.	(A)	(A)
E.2 Check security of panels, operation of lighting, indicators, replace lamps as necessary.	(A)	(A)
E.3 Re-set all time clocks for winter/summer time	(A)	(A)
Note: Electrical Periodic testing to be carried out every 3 years and instructed by the Contract Administrator.		
TASK PRESSURISATION UNITS AND BUFFER VESSELS	MTHW	LTHW
PU.1 Check for correct operation and pressure	(6M)	(6M)
PU.2 Prepare for insurance inspection where applicable.	(A)	(A)
PU.4 Check and test all buffer vessels for correct operation and report defects to the Contract Administrator	(6M)	(6M)
PU.5 Pressurisation units are to be fully serviced by the manufacturer	(A)	(A)
TASK FIRE AND SAFETY EQUIPMENT	MTHW	LTHW
FS.1 Check and test all fire circuits.	(A)	(A)
FS.2 Check condition of equipment, extinguishers, etc. Submit immediate report to Contract Administrator if equipment is missing, considered to be inoperative or in need of replacement	(A)	(A)

FS.3	Fire Pumps - Diesel/Electric	(A)	(A)
	(a) Run up and test check oil levels and coolant quality.		
	(b) Carry out full service and report on condition.		
	(c) Check operation of cold water storage supply tank ball valve		
	(d) Clean and chlorinate cold water storage supply tank as detailed in task CW.2		
FS.4	Check and test all GMI Gas/CO detection sensors and panels manufacturer or specialist Contractor to be used to carry out the work.	(A)	(A)
TASK	GENERAL TASKS BOILERHOUSES, PLANT ROOMS, BOOSTER PUMP ROOMS, TANK ROOMS, GAS METER ROOMS AND ASSOCIATED AREAS	MTHW	LTHW
PR.1	Check security of doors, windows, etc., report any defects to the Contract Administrator	(M)	(Q)
PR.2	Ensure adequate ventilation, grilles unobstructed, fan operation, change fan duty if appropriate.	(Q)	(Q)
PR.3	Remove and clean ventilation grilles, filters, lubricate ventilation fan bearings.	(Q)	(Q)
PR.4	Inspect condition of internal decoration, including walls, ceilings, floor, plinths, fixtures and fittings. Report findings to Contract Administrator	(A)	(A)
PR.5	Check for leaks; secure clean and adjust as	(M)	(Q)
PR.6	Log meter readings calculate and record advances on meters supplying district heating plant.		
	(a) Gas	(M)	(M)
	(b) Electricity	(M)	(M)
	(c) Water	(M)	(M)
PR.7	Provide monthly summary report of logged meter date to Contract Administrator.	(M)	(M)
PR.8	Clean floors, toilet/washing facilities.	(6M)	(6M)
PR.9	Check all necessary warning notices are displayed and provide new where required.	(A)	(A)

PR.10 Check for any unusual noises, smells, conditions associated with operation of plant and equipment, investigate and report as necessary.	(M)	(Q)
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TASK OTHER TASKS	MTHW	LTHW
OT.1 Check all gas pipe work for gas soundness.	(A)	(A)
OT.2 Check operation of all valves and controls associated with gas burners and report all defects.	(A)	(A)
OT.3 Water treatment of Primary and Secondary Heating / Hot water including testing and independent sample analysis by laboratory in accordance with this Specification paragraphs 7.10 – 7.18	(Q)	(Q)
OT.4 Clean the glands and repack and overhaul as necessary.	(A)	(A)
OT.5 Check for correct operation of all automatic valves controlling temperatures, pressures or volumes.	(Q)	(Q)

Note: Where a valve is being used for balancing, the valve must be reset to the original settings.