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**FINGAL COUNTY COUNCIL
STANDARD SPECIFICATION**

**SPECIFICATION FOR
INSTALLATION OF
OIL FIRED CENTRAL HEATING SYSTEMS
IN NEW / EXISTING DWELLINGS**

**FINGAL COUNTY COUNCIL
ARCHITECTS DEPARTMENT**

SPECIFICATION FOR INSTALLATION OF OIL FIRED CENTRAL HEATING SYSTEMS IN NEW/EXISTING DWELLINGS

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SPECIFICATION FOR INSTALLATION OF OIL FIRED CENTRAL HEATING SYSTEMS IN EXISTING DWELLINGS

1. General

This specification covers the requirements and conditions for the installation of oil fired central heating systems into occupied and existing council dwellings. It should be read and construed together with drawings indicating layout of radiators and design of heating systems generally.

The oil boiler will be free standing and be generally located externally on the rear wall of the dwelling. The system to be piped in copper unless otherwise approved or specified.

The system design will be as indicated on layout plans attached.

All motorised valves, thermostats and programmers will be included to achieve maximum control and energy efficiency as specified. Samples of all materials will be supplied for approval by Fingal County Council before any installation work commences.

A twelve month maintenance period applies to this contract. The true meaning and intent of all clauses of the F.C.C. General Housing Specification applies as do all clauses of GDLA 82.

2. Compliance with Standards and Regulations

The installation of gas central heating will be carried out by suitably qualified and competent tradesmen and in accordance with B.S. 5410-1:1997 and the Building Regulations.

3. Safety Statement

The contractor will be required to produce a current Health and Safety Statement in accordance with the Health and Safety at Work Act 2005.

4. Equipment to be installed in each Dwelling

The installation of the heating systems shall be as per attached drawings generally, and will consist of the following items of equipment:

1. Oil fired condensing boiler, free-standing and sized for particular house type. A rated as 'Grant' or equal and approved.
2. External galvanized casing as Heat-pac housing unit or equal and approved for above.
3. Frost thermostat.
4. Radiators as indicated on drawings of correct output and adjusted in physical dimension when and where required.
5. Circulating pump of required flow rate as part of boiler or separate.
6. Expansion vessel of correct size, charge, and pressure.
7. Pegler Valves, or similar and approved, for each radiator except hall and bathroom.
8. Cylinder Thermostat, Strap on type
9. Programmer, 2 channel or 3 channel as required.
10. 2 x 2 port valves (one to three bed dwelling) or 3 x 2 port valves (four-bed dwelling).
11. Sealed system.
12. A safety valve of approved type.
13. A pressure gauge.
14. Cylinder lockshield balancing valve.
15. A high limit manual reset boiler thermostat.
16. Automatic air vent.
17. System by-pass automatic.
18. A non-return valve with gate valve (filling line).
19. Drain points on heating and hot water system.
20. A bunded Oil tank and support.

5. Boiler

The manufacturer and type of boiler to be used in each dwelling will be agreed with F.C.C. before commencement of the works. Boilers selected will comply with the following requirements:

- CE approved with thermal output specified.
- Fitted with a manual reset high limit thermostat.
- Variable flue extensions, if necessary.
- Operational with available static head pressure as part of semi-sealed system.

The oil boiler shall be installed in accordance with the manufacturers instructions and B.S. 5410-1:1997. The boiler will be installed externally in a suitable location on the rear wall of dwelling, so that the flue outlet is at least 600mm from any opening (or other approved area as agreed on site), avoiding corner locations where possible, and with adequate room for servicing and maintenance. A safety valve to B.S. 795 will be fitted to upper part of boiler water section or on the flow pipe as close as possible with no intervening valve or restriction. The safety valve will be non-adjustable and pre-set to a lifting pressure not exceeding 3 bar. This valve will be accessible for testing. The discharge from this valve will be piped in 15mm pipe with an appropriate fall to an external location and turned downwards against external wall face to avoid accidental injury from scalding water to discharge. A pressure gauge will be installed with a range of 0 – 4 bar and will be sited for convenient inspection. Flue will be installed in accordance with particular boiler manufacturer instructions and Flue terminal Guard will be installed if there is any risk of persons coming in contact or risk of damage to exposed flue terminal.

Boilers will be commissioned in strict accordance with particular manufacturer instructions and arrangements will be made for F.C.C. Inspector to witness all testing and commissioning.

6. Radiators

The radiators will be installed as per locations on attached drawings, and type of radiator will be agreed in advance of installation. **As a general rule all radiators will be installed on external walls in individual rooms below windows unless otherwise agreed.** Where radiators **must** be installed on internal walls the output of the particular radiator will be increased by a margin of 10% - 15%. Radiators will be roll top convector type with no sharp edge or side/top plates. Radiators will

be capable of producing their stated output with a mean water temperature of 55 degrees centigrade. Radiators will be hung securely with brackets provided and fitted with Terrier/Peglar lockshield valves or similar approved with stem seal replaceable without having to drain system. Thermostatic Radiator Valves are to be mounted **horizontally** to achieve maximum efficiency. Radiators in hall and bathroom to be fitted with standard manual Peglar or equivalent approved. In dwellings for the elderly i.e. one-bed units or those dwellings designated for handicapped or the elderly, the TRV's will be **T.B.O.E.** to facilitate convenient operation. A radiator on the ground floor will be fitted with Myson drain tail for flushing and future draining of the system. All radiators will be covered to protect finish until final commissioning and handover.

7. Domestic Hot Water

The domestic hot water cylinder will be 136 litres capacity and factory insulated with an indirect 28mm coil. The cylinder will be fitted with a strap on thermostat 1/3 from the base of the cylinders height to control temperature of domestic hot water. The primary supply of the coil in the cylinder is to be made off to the bottom connection to improve heat recovery time. The primary supply pipe to the coil to minimum diameter of 22mm and fitted with a lockshield balancing valve for adjustment when commissioning.

8. Circulating Pump

If the circulating pump is not supplied as part of a system boiler then the following will apply:

- Pump will be close to the boiler on main flow pipe.
- Fully accessible for maintenance.
- Fitted with valves to allow replacement without the need to drain system.
- Capable of maintaining a flow rate of 1.5 metres per second throughout the system.”
- To

“If the circulating pump is not supplied as part of a system boiler then the following will apply:

- The installed pumps will comply with IS EN 16297-1:2012.

- Equipped with surge protection.
- Replacement pumps to be agreed upon by FCC Mechanical Inspector.
- Pump will be installed close to the boiler on main flow pipe.
- Fully accessible for maintenance.
- Isolating valves to be complete with spindle gate valve types.
- Capable of maintaining a flow rate of 1.5 metres per second throughout the system.
- Fitted with Brass Impellers (Grundfos, Wilo or equivalent and approved by the FCC Mechanical Inspector).
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9. Expansion vessel

A diaphragm type vessel to B.S. 4817 Part 1 will be used to accommodate the increase in water volume at system rise in temperature.

If the vessel is not supplied as part of a system boiler then the following will apply:

- Connecting pipework will not be less than 22 mm.
- A lockshield gate valve to be installed to allow for maintenance of the vessel.
- Expansion may be located remotely from the boiler.
- Capacity of vessel will accommodate increase in volume when system is heated to 110 degrees centigrade.
- Vessels charge pressure will not be more than the static head pressure of the system at point of connection to circulating pipe minus 0.2 bar.
- Pressure in the system at 100°C will be at least 0.35 bar less than the lift pressure of the safety valve.
- Expansion vessel to be properly supported with manufacturers brackets or by wallplate elbow 321.
- Vessel will be positioned to provide access for maintenance and charge pressure testing.

10. Controls

The controls for the system will be capable of providing independent time and temperature control for the heating system and the domestic hot water by use of the following components.

- 2 no. 2 port valves with auxiliary switches.
- A strap on cylinder thermostat.
- A 2 Channel programmer as approved.
- A room thermostat
- A Myson TRV 2-WAY for each bedroom radiator.

The position of the motorised valves and cylinder thermostat will be agreed with F.C.C. in advance. Spur (3 Amp), programmer and wiring centre will be positioned below the boiler in accessible and user friendly location. All electrical connections to the heating system will be carried out by qualified electricians and will comply fully with E.T.C.I. Regulations for Electrical Installations and in accordance with manufacturer instructions for all components.

Contractor will ensure that reverse circulation will not occur in any system with the installation of automatic controls for separate hot water and heating.

11. Oil Storage Tank

Provide a Bunded oil storage tank, 1100 litres minimum 2500 litres maximum capacity, complete with oil gauge and Tiger Loop. The tank shall be integrally bunded of plastic construction complying with OFTEC Standard OFS T100 and carry an OFCERT licence to show compliance.

Support the entire base of the tank with concrete lintels bearing on blockwork sleeper walls and in accordance with the tank manufacturers recommendations. The tank should be sited at least 2 metres from any building and no closer than 760 mm from any boundary

12. Fire Valve

A fire valve should be fitted so as to cut off the supply of oil from the heating appliance in the event of an accidental fire.

13. Pipework – Copper

The pipework to the boiler, cylinder, fill tank and radiators will be copper tube to I.S. EN1057. Plastic and Multi-Layer pipe will not generally be permitted.

Where copper pipe is laid in a floor screed or concealed under floors the contractor shall ensure that the minimum possible number of joints are made. All solder joints shall be cleaned of excess solder flux residue when cool.

Where copper pipe is laid in floor screed or floor slab it shall be insulated with 13mm wall thickness open cell pipe insulation 'Aerotube' or similar and approved. Ensure pipes are completely covered and insulation is cut to properly fit around brackets, fittings and valves. All joints on the insulation shall be tight and taped. Copper pipe

shall not come in contact with concrete, plaster or masonry. Adequate cover to buried copper pipe will be provided at all locations.

Where copper pipe is located in attic spaces it shall be insulated with 22mm wall thickness closed cell pipe insulation 'Armaflex' or similar and approved. Ensure pipes are completely covered and insulation is cut to properly fit around brackets, fittings and valves. All joints on the insulation shall be tight and taped. All jointing will be with soldered fittings.

All pipework will be pressure tested to 4 bar and remain drop tight for a period of 2 hours.

Pipe runs in as far as possible shall be either vertical or horizontal. All pipework shall be supported clear of the supporting surface at spaces not exceeding those referred to in Table 1. Pipe clips shall be of a type that ensures no contact between the pipe and the surrounding surface. Single nail clips are not acceptable for this purpose.

Compression tube fittings of copper and copper alloy, including stopcocks, gate valves, M.T. fittings and flanged tank connectors shall comply with I.S. EN1254:Pt.2 and shall bear the Irish Standard Mark. Capillary fittings shall comply with I.S. EN1254:Pt.1. A copy of the manufacturers or suppliers certificate shall be available for submission to the architect if requested.

Table 1 Maximum interval between pipe supports (Copper pipes).

Nominal size mm	Interval for vertical runs m	Interval for horizontal runs m
Up to 15	2.0	1.2
22	2.5	1.8
28	2.5	1.8

14. Pipework – Multi-Layer and Plastic (where permitted)

F.C.C. will not generally permit the use of Multi-Layer and thermoplastic pipe. Their use will be considered on sealed heating systems subject to prior agreement, before commencement of the works, provided it is installed in **STRICT COMPLIANCE** with the manufacturer's requirements and the following:

- Where Multi-Layer and thermoplastic pipe is used as an alternative to copper pipe it will conform with the relevant standard for the product. Selection of the material will be appropriate for LTHW sealed heating systems. Distribution manifolds will be considered.
- Installation will conform to B.S. 5955-8.

- The installation pipework will be clipped at proper intervals and be neat in appearance.
- Pipework will be installed so as to protect the product where it enters and exits floors and walls.
- Thermoplastic pipe shall not be connected directly to a boiler.
- Thermoplastic pipe shall not be connected directly to a radiator.
- Thermoplastic pipe shall not be used in a hotpress area.
- Pipework laid in concrete will be sleeved/insulated for easy removal if necessary, at future date.
- **All pipework will be pressure tested to 4 Bar and remain drop tight for a period of 2 hours (min).**
- Insulation shall be provided as set out for copper pipework in Clause 14 above

15. Testing and Commissioning

The heating system will be pressure tested at 3 bar and will remain drop tight for a period of 2 hours (min). This test will be witnessed by F.C.C. staff. The system will be treated with SENTINEL X300 UNIVERSAL CLEANSER. The system water will be circulated at normal operating temperature for at least 1 hour with all valves open. The system will then be drained and filled with clean water. With the pump running the drain valve will be opened until the water runs clear. When flushing is complete SENTINEL X100 INHIBITOR will be added at the rate of not less than 1% of system volume.

When all services to the heating system have been connected the following checks will be carried out:

1. The boiler will be commissioned in accordance with the manufacturer instructions. In new housing schemes manufacturer of boiler to commission unit.
2. The oil burner must be correctly set to the oil flow rating and adjusted as necessary to match the boiler system requirements.
3. The expansion vessel charge pressure will be set.
4. The pump speed, cylinder balancing valve and radiator balancing valves will be adjusted to ensure the correct distribution of heat throughout the system.
5. The by-pass valve will be adjusted to give minimum flow rate required for the correct operation of the boiler when all other circuits are closed.
6. The correct operation of the programmer, motorised valves, cylinder thermostat and all TRV's will be checked.
7. The correct operation of the boiler thermostat, high limit manual reset stat safety valve, and pressure gauge will be checked.
8. The heat up time of the hot water cylinder will be checked.
9. The correct operation of all radiators will be checked.
10. Automatic air vents will be checked open.

16. Control Settings

The control settings will be as follows:

Boiler thermostat	65 Deg C
Cylinder thermostat	60 Deg C
TRV's	Max

The programmers time will be set to the correct time.

17. User Instructions

The contractor will ensure the following are made available, either directly to the tenant or to the hand over Clerk of Works for issue to the tenant.

1. User operating instructions for the boiler and the programmer.
2. Air vent keys.
3. Key to heat-pac housing unit

18. DIAGRAM 1. - Central Heating System Schematic

