Appendix 4.2 F
Fire Hydrant Flow Simulation Testing

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SES WATER MANAGEMENT
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Hydrant Testing Report

Naas, Co. Kildare

Client:	Donnacadh O'Brien Associates
Site Contact:	Richard Kiernan
Project:	Hydrant Testing & 7 Day Logging Naas, Co. Kildare
Technician:	Aaron Hogan
Start/Finish of Survey	17/01/2023

Contents

1 Scope of Works

SES Water Management were requested by Donnocadh O'Brien Associates to carryout flow and pressure testing on hydrants at Naas, Co. Kildare.

Pressure logging of the hydrants was carried out over a 7-day period. Flow testing was then carried out using a digital flow meter with static and residual pressures also being recorded.

2 Hydrant Specifications & Flow Requirements

2.1 Guidelines for Fire Flow Requirements

Housing Developments
Housing Developments with units of detached or semi-detached houses of not more than two floors should have a supply capable of delivering a minimum of 8 l/s (480 l/min) OR multi occupied developments with units of more than 2 floors should have a water supply capable of delivering a minimum of 20 to 35 l/s (1,200 to 2,100 Litres/minute).

Village Hall or the like
Should have a water supply capable of delivering 15 Litres per second (900 Litres/minute) through any single hydrant on the development.

Primary School and/or Single Storey Health Centre or the like
Should have a water supply capable of delivering 20 Litres per second (1,200 Litres/minute) through any single hydrant on the development.

Secondary Schools, Colleges, Large Health & Community Facilities or the like
Should have a water supply capable of delivering 35 Litres per second (2,100 Litres/minute) through any single hydrant on the development.

Industry
Up to one hectare, facility should have 20 Litres per second (1,200 Litres/minute)
Between one and two hectares, facility should have 35 Litres per second (2,100 Litres/minute)

2.2 Key Aspects of Fire Hydrant Specification

SURFACE:
Hydrants should be located in the footpath or grass margin adjoining the roadway. Where it is located in the grass, the periphery of the box should be concreted. The surface box and concrete surround should be kept over the level of the adjoining surface to prevent polluted water from entering the hydrant pit.

FRAME:
Hydrant chambers should have a cast iron surface box. The surface box should be bedded in mortar on the chamber walls, and if the hydrants are located other than on a footway or roadway, they should be surrounded by 150mm concrete of 100mm in depth.

COVER:
The hydrant cover should provide a 375mm x 225mm clear opening and should be placed centrally over the hydrant to permit freedom of affixing stand-pipe and valve key.

PIT:
The hydrant pit / chamber should provide not less than 75mm clearance around the hydrant body. Hydrant pits should be constructed to be self-draining. The pit should be clean and free of all debris.

OUTLET DEPTH:
The depth of the hydrant outlet should not exceed 350mm below finished ground level, with the top of the spindle being 75mm minimum to 225mm maximum below finished surface to footpath.

MARKER:
A hydrant indicator plate should be fitted on a wall or marker post at 450mm over ground level. They should show the diameter of the water main and the distance in metres of the hydrant from the marker.

TESTING:
Fire hydrants should be tested on an annual basis. The Fire Hydrant condition should be assessed to ensure it meets the required criteria. The flow and pressure should be recorded and reported in writing. Calibration certificates must be available for all test Equipment used.

3 Fire Hydrant Condition Survey

The hydrant to be flow and pressure tested was reviewed to assess that it meets the standards in accordance with the BS9990.

Appendix A provides full details of the condition survey which was completed on site. The items below are the main findings of the fire hydrant condition survey;

- All Hydrants are accessible and have spindles in place, except for FH2 where the Spindle is missing.
- All Hydrant Pits are in good condition, and the hydrants Frames/Covers are in poor condition.
- Hydrant outlet FH1 and FH2 connections are LUG, FH3 is an LRT connection.
- All Hydrants have marker plates to identify hydrant location/details.
- The covers to the Hydrant chambers are NOT painted canary yellow.


FH1


FH1


FH2

FH2


FH3


FH3

Figure 1: Fire Hydrant Condition Images

4 Fire Hydrant Flow, Pressure Testing & 7-Day Logging

4.1 7-Day Pressure Logging

Pressure loggers were deployed on the Fire Hydrants on 17th January 2023 to record pressure over a 7-day logging period. The graph below shows the pressure logging results which show the day night variation in pressure. There is a pressure reducing valve in operation in the area reducing pressure from 1:00a.m to 6:00am.

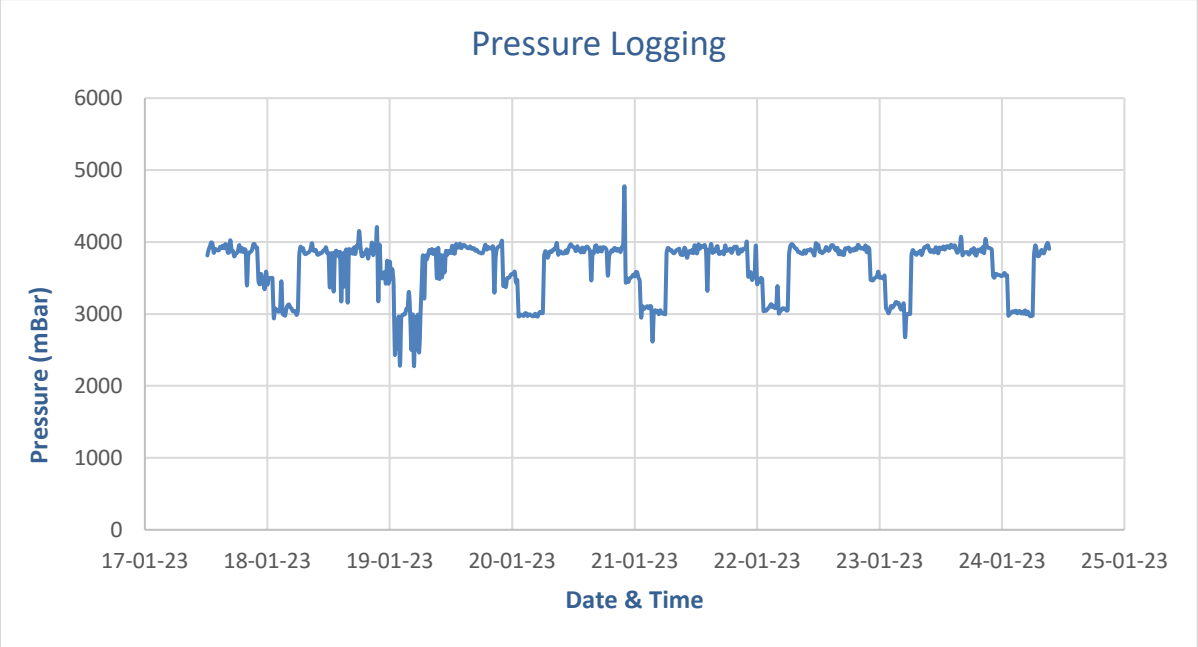

Figure 1: 7-Day Static Pressure Logging Results

Based on the downloaded pressure data, the static pressure varies from 3.0 bar at night to 4.0 bar during the day.

4.2 Hydrant Testing

Flow testing was carried out on the hydrants and the results are documented in the table and graphs below.

The test includes measuring the static pressure at the test hydrant before the flow test begins. A digital hydrant flow meter is connected to the hydrant to record flow rates in Litres per minute over a 5-minute period. The flow rates detailed below, are the average maximum sustainable flow based on the 3-minute flow test.

Flow testing was carried out on 24th January 2023 at 09.30hrs and the results are details in the table below.

FH No.	Flow Rate L/Min	Static Pressure (bar)	Residual Pressure (bar)
FH1	1300	3.5	2.8
FH2	1580	3.5	2.3
FH3	1697	4.0	3.2

Table 1: Fire Hydrant Flow & Pressure Test Results

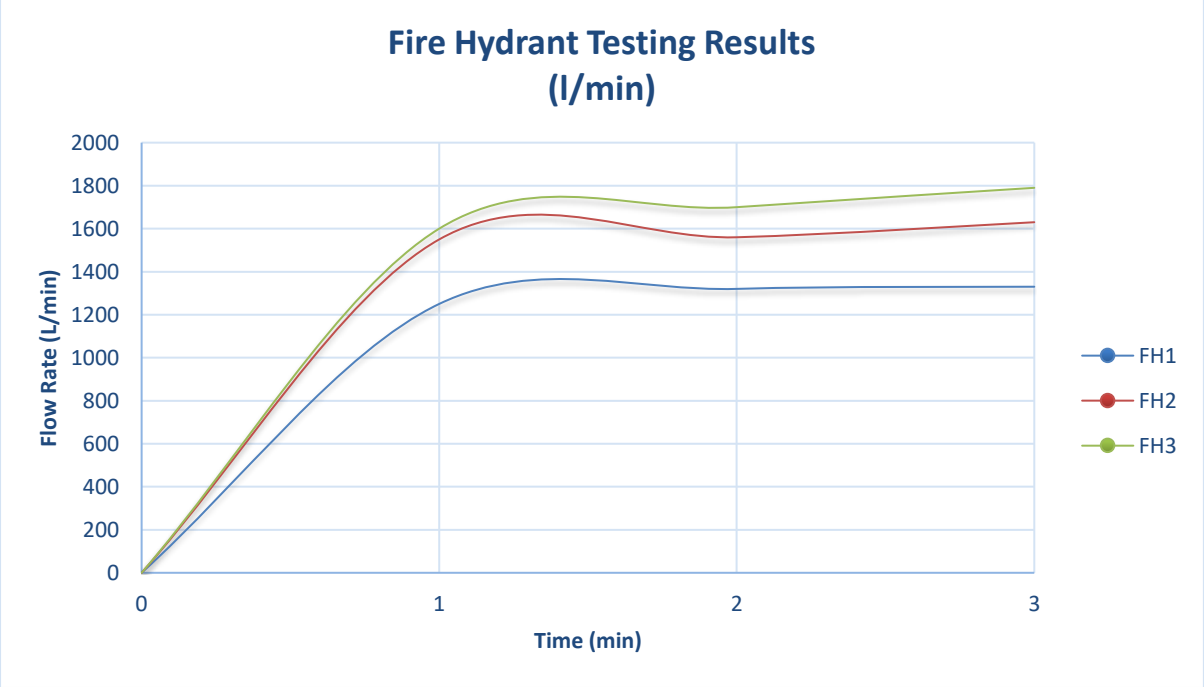

Figure 2: Fire Hydrant Flow Test Results

5 Fire Hydrant Location Plan

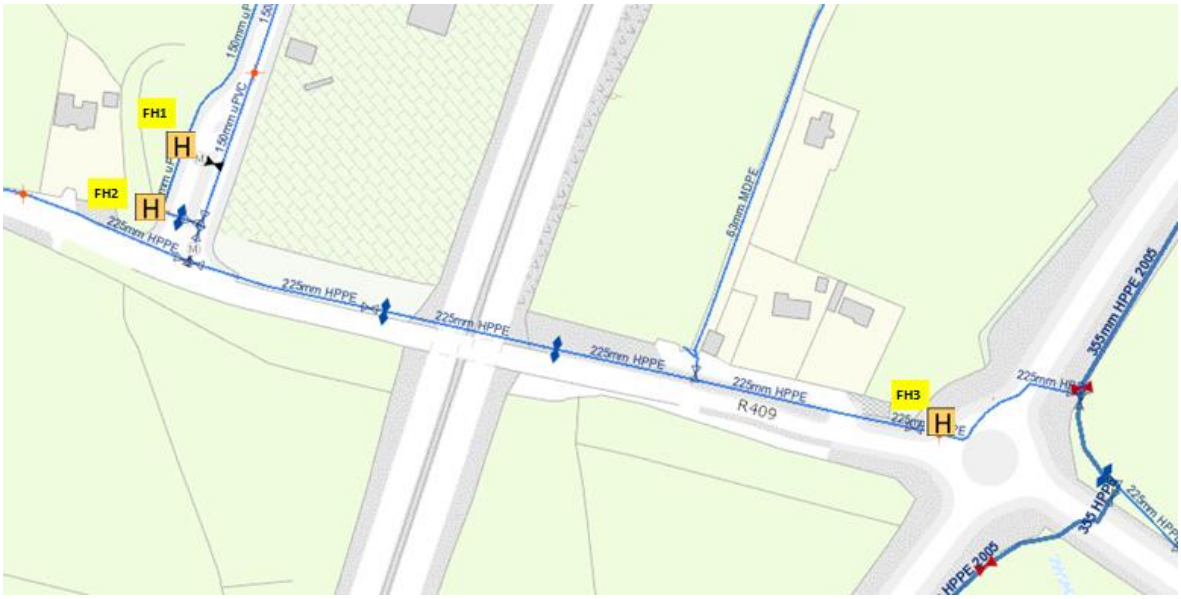

Figure 3: Fire Hydrant Location Plan

Appendix A – Fire Hydrant Condition Survey

FH No.	Surface	Cover / Frame	Pit	Type	Depth	Marker / Plate	Canary Yellow	Spindle	Operating	Comments
1	Grass	Poor	Good	LUG	290	Yes	No	Good		No Plinth
2	Grass	Poor	Good	LUG	370	Yes	No	Missing		No Plinth
3	Grass	Poor	Good	LRT	520	Yes	No	Good		No Plinth