**HYDRAULIC SERVICES WITNESS TESTING**

**HCAA-011 - COLD WATER TESTING AND COMMISSIONING**

V2021.01 - April 2021

**GENERAL NOTES:** *This form is to be used for the purpose of witness testing a hydraulic installation by* ***a suitably Qualified Hydraulic Consultant****. Completion of all applicable sections is required. This form should be filed to the relevant project folder within 10 business days after witnessing has occurred.*

***Notes:*** *This series of Hydraulic Testing Procedures have been designed to assist the Hydraulic Services Consultant to carry out suitable witness testing at the end of a project. Each set of procedures details an industry accepted, list of objectives, that the Hydraulic Services Consultant should carry out to fulfil their design commission. The series of procedures will offer the client security in the knowledge that the objectives identified have been based on an Industry standard, endorsed by the HCAA (National), which represents the Professional Industry of Hydraulic Services Consultants.*

|  |  |  |  |
| --- | --- | --- | --- |
| Project: |  | Project Number: |  |
| Prepared By: |  | **Report Date:** |  |
| Plumbing Company: |  | **Consulting Company:** |  |
| Plumbers Name: |  | **Consultant’s name:** |  |
| Plumbers license number |  | **Consultant’s certification n**umber: |  |
| Date of Test/Inspection: |  | **Drawing Revision**: |  |
| Equipment |
| Backflow Test Kit Serial Number |  | Backflow Test Kit Verification Date: |  |
| Flow and Pressure Test Kit Serial Number: |  | Flow and Pressure Test Kit Verification Date: |  |

|  |
| --- |
| Plumber to provide the following for witness testing:* Pump duty to be provided with pump curve

Witness to provide the following for witness testing* Consultant to witness pumps under operation and to be provided with a copy of this document

The hydraulic services elements of the Project have been tested in accordance with: |
| Number | **Title**  |
| NCC Volume 1 | Building Code of Australia 2019 |
| PCA 2019  | Plumbing Code of Australia 2019 |
| AS/NZS 3500.1-2018  | Plumbing and Drainage -Part 1: Water services |

|  |  |
| --- | --- |
| Plumbers Declaration | I hereby state that that the information provided in this form is a true and accurate record. |
| **Signature:** | **Date:** |
| Consultants Declaration | I hereby state that that the information provided in this form is a true and accurate record. |
| **Signature:** | **Date:** |

**The hydraulic services being tested and recorded in this document are:**

|  |  |
| --- | --- |
| Yes | No |
| 1. Fixture outlet pressure and flow rates
 |  |  |
| 1. Backflow prevention valve
 |  |  |
| 1. Water quality generally
 |  |  |
| 1. Water flushing and sterilisation
 |  |  |
| 1. BMCS outputs
 |  |  |
| 1. Post water supply failure system
 |  |  |
| 1. Validation of pump design
 |  |  |

1. **Fixture outlet pressure and flow rates**

**Work Description:** We will randomly select fixtures and test the maximum static outlet pressures does not exceed 500kPa and that the flow rates match the designated flow.

**Suggested tools:** flow cup, pressure gauge

|  |  |
| --- | --- |
| Fixture Type Selected |  |
| Brand / Model |  |
| Static Pressure |  |
| Fixture Outlet pressure and Flow |  |

1. **Backflow Prevention Valve**

**Work Description:** Randomly **t**est a room specific backflow device and ensure there are no cross connections. Ensure no fixtures used for personal hygiene are supplied through the valve such as hand basins. Identify valve locations conform with drawings. Confirm no back leakage occurs.

**Suggested tools:** Backflow test kit and key for box.

|  |  |
| --- | --- |
| Yes | No |
| Cross Connections |  |  |
| Location Correct |  |  |
| Back Leakage |  |  |

1. **Water quality generally**

**Work Description:** Review Water test results and ensure water quality requirements have been met.

**Suggested Tools:** Water test kit to send to a lab and or test results from a reputable lab.

|  |  |
| --- | --- |
| Yes | No |
| Tested water quality in relation to microbial growth & AS3666 |  |  |
| Tested water quality in relation to NSW Health and other drinking water requirements |  |  |
| Tested water quality in relation to legionella |  |  |

1. **Water flushing and sterilisation.**

**Work Description:** Witness water flushing and sterilisation procedures.

**Suggested Tools:** Flushing point and sterilisation equipment

|  |  |
| --- | --- |
| Yes | No |
| Water flushing velocity calculations ensuring velocity is in excess of 0.75m/sec |  |  |
| Sterilisation as required |  |  |
| Consideration given to DVGW 551 |  |  |

1. **BMCS outputs**

**Work Description:** Review and validate that any services nominated to be connected to the BMS have been connected, such as water meter data, tank levels, pump failures etc.

**Suggested tools:** Access to BMCS system and our BMCS outputs list

|  |  |
| --- | --- |
| Water meter validation data |  |
| Tank water float measurements |  |
| Pump fails |  |
| Water main fail |  |

1. **Post water supply failure system**

**Work Description:** Ensure any systems installed to detect failures within the private water service network are

**Suggested tools:** Access to BMCS system and water usage data

|  |  |
| --- | --- |
| Yes | No |
| Demonstrate the pressure sensor can identify a simulated water main failure |  |  |
| Demonstrate the duration of cooling tower water usage and validate against the design |  |  |
| Identify BMCS outputs during the post water supply failure identifying water remaining and other warnings against the functionality brief  |  |  |

1. **Validation of Pump design**

**Work Description:** Review various hydraulic systems and validate them against the original design

**Suggested Tools:** No tools required, just your eye’s.

|  |  |
| --- | --- |
| Yes | No |
| FLOW TEST PUMPS AND DEMONSTRATE PRESSURE AND FLOW IS EQUAL TO THE DESIGN: |
| Pumps fail and change over test |  |  |
| Pump closed head park test |  |  |
| Control panel fail and change over test |  |  |
| If exceed demonstrate that all material/components are within safe working pressures and flow rates do not exceed the safe velocity |  |  |
| For tall buildings identify the pump park pressure and demonstrate that all the material/components are within safe working pressures |  |  |
| Demonstrate flow of the filters and filtration ability and validate against design |  |  |
| WATER TANKS: |
| Validate water level sensors working |  |  |
| Isolation valves for 50% partitions work |  |  |
| Fill valve functions and flow rate compared against design |  |  |
| Validate internal tank waves and validate against requirements  |  |  |
| SYSTEM PSD FLOW RATE TEST: |
| Validate maximum and minimum pressures against the design and the most advantaged and disadvantaged sections of the system  |  |  |
| SYSTEM STATIC PRESSURE: |
| Most disadvantaged static pressure test and validate against design |  |  |
| Most advantaged static pressure test and validate against design and 500kPa |  |  |
| Demonstrate safe working pressures of all material/components are not exceeded |  |  |
| PRESSURE REDUCTION VALVE |
| Demonstrate flow rate pressure and validate against design |  |  |
| Demonstrate the flow staging of each valve (can use outlet pressures) |  |  |

1. **PRE START PUMP CHECKS**
	1. **GENERAL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | DESCRIPTION | PASS | FAIL | COMMENTS |
| 1.1.1 | Equipment is free from damage |   |  |  |
| 1.1.2 | Where vibration mounts are installed ensure they are correctly anchored to the plinth and that anchor bolts are tight |  |  |  |
| 1.1.3 | Check all holding down bolts (base, pump & engine) are tight |  |  |  |

* 1. **PIPEWORK**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | DESCRIPTION | PASS | FAIL | COMMENTS |
| 1.2.1 | Test/drain valve is fitted, installed in the correct position and piped to waste |  |  |  |
| 1.2.2 | Where a main pump by pass is fitted, ensure the non-return valve is installed so that pump pressure holds it closed |  |  |  |
| 1.2.3 | Pipework is adequately supported |  |  |  |
| 1.2.4 | Water supply is available |  |  |  |

 **1.3 CONTROL PANEL**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | DESCRIPTION | PASS | FAIL | COMMENTS |
| 1.3.1 | Control panel is free from damage |  |  |  |
| 1.3.2 | Power supply is via a main isolating switch |  |  |  |