



# CS11 – Wastewater Pump Station

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## **CS11 Wastewater Pump Station**

### **11.1 General**

#### **11.1.1 Associated Standards**

All works shall be in accordance with relevant NZS/AS production and construction standards for pipeworks.

#### **11.1.2 Existing Utility Services**

Before commencing any excavation, all service utility providers shall be contacted and any approvals necessary for excavating in the vicinity of their services shall be obtained in writing. Any conditions stipulated by the utility provider in regard to working in the vicinity of their service/s shall be followed.

#### **11.1.3 Setting Out**

The alignment of the pump station shall be set out with reference to permanent land transfer pegs or temporary boundary marks placed by the licensed cadastral surveyor responsible for the final land transfer pegging.

### **11.2 Excavation**

Please refer to CS5-6 Stormwater & Wastewater Construction Standard.

### **11.3 Bedding, Pipelaying and Jointing**

Please refer to CS5-6 Stormwater & Wastewater Construction Standard.

### **11.4 Backfilling**

Please refer to CS5-6 Stormwater & Wastewater Construction Standard.



## 11.5 Manholes

Please refer to CS5-6 Stormwater & Wastewater Construction Standard.

## 11.6 Inspection

The Consent Holders representative shall arrange a suitable inspection or test witnessing with Councils Engineer.

## 11.7 Testing and Commissioning

The following testing and commissioning requirements shall be met:

### 11.7.1 Commissioning of Pumps

This involves but is not limited to the following:

- All tests and checks required for provision of certificate of electrical compliance by a registered electrician.
- Receipt of factory test certificate for the pumps.
- Ensuring all machines are clear of all debris and tools.
- Testing of equipment duty and performance.
- Operation of each piece of equipment singly and in their possible combinations to confirm system and component performance.
- Checking signals from all level control equipment to ensure safe operation and to ensure machines will not run dry.
- Vibrational checks.
- Ensuring that all overload systems are functioning.
- Setting to work in the normal automatic operational mode after the tests have been completed.
- Where any of the above fail to satisfy the requirements of the specification or the engineer, correct the defect and retest.
- Oversee operation and carry out adjustments as necessary throughout the defects liability period.

### 11.7.2 Commissioning of Electronic Equipment

This involves but is not limited to the following:



- All tests and checks required for provision of an electrical compliance by a registered electrician
- Receipt of factory test and calibration certificates.
- Tests as per manufacturers installation requirements.
- Calibration check against a standard.
- Confirmation of protection against out of specification power impulses.
- Checking signals to and from the control system.
- Checking signals to and from any remote sensors.
- Setting to work in the normal automatic operational mode after the tests have been completed.
- Where any of the above fail to satisfy the requirements of the specification or the engineer, correct the defect and retest.
- Oversee operation and carry out adjustments as necessary throughout the defects liability period.

### **11.7.3 Testing and Commissioning of Control Systems**

This involves but is not limited to the following:

- Ensure all mechanical, electrical and electronic systems are set to work and are 'on-line' to operate.
- Simulate all level induced control functions.
- Operate all control modes.
- Check all remote control and monitoring functions.
- Where any of the above fail to satisfy the requirements of the specification or the engineer, correct the defect and retest.
- Oversee operation and carry out adjustments as necessary throughout the defects liability period.

### **11.7.4 Testing of Rising Mains**

The following procedure may be used only for the testing of polyethylene pipelines. Whilst the normal procedures followed and precautions taken for hydrostatic pressure testing of completed pipework apply equally to polyethylene systems, some variations are necessary because of the mechanical properties of polyethylene (PE).

The rising main should be tested to a pressure not less than 2.5 times the calculated dynamic pumping head.

Test pressures must be limited to 1.5 times the rated pressure and reduced accordingly if the test water temperature is above 20°C.



The test method involves calculating the rate at which the test pressure decays and is used for large diameter or long lengths of pipe.

The duration of the test should be limited to 1 hour.

When the main is fully charged and all air vented the system should be allowed to stabilize before the test procedure begins.

Pressure should be applied at a constant rate and the time  $t_L$  taken from the start of pressurization to attainment of test pressure must be recorded.

Readings of pressure decay at time intervals in minutes must be taken and recorded.

The first such reading  $P_1$  is taken at a decay time  $t_1$  equal to or greater than  $t_L$ .

The second reading  $P_2$  is taken at a decay time  $t_2$  equal to or greater than  $5 \times t_L$ .

$$\text{Calculate } N_1 = \frac{\log_e P_1 - \log_e P_2}{\log_e t_2 - \log_e t_1}$$

which should be between 0.04 and 0.12. If  $N_1 > 0.25$  an unacceptable leak is indicated.

The third reading  $P_3$  is taken at a decay time  $t_3$  equal to or greater than  $15 \times t_L$ .

$$\text{Calculate } N_2 = \frac{\log_e P_2 - \log_e P_3}{\log_e t_3 - \log_e t_2}$$

If  $N_2 > 0.25$  an unacceptable leak is indicated. If the ratio is less than 0.8 an unacceptable leak is indicated.

## 11.8 Reinstatement

Reinstatement of roads and pavements shall be in accordance with DS12 – Road Reserve Occupancy.

Reinstatement of reserves and grassed berms shall be in accordance with DS 2 – Streetscape

## 11.9 As-Builts

Please refer to (as-built section) for all As-built requirements.