



**DUBBO
REGIONAL
COUNCIL**

TECHNICAL SCHEDULE

DRC-W403

CALIBRATION OF INSTRUMENTS

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CLAUSE	CONTENTS	PAGE
DRC-W403.1	Scope _____	3
DRC-W403.2	Referenced Documents and Standards _____	3
DRC-W403.3	Labour, Plant and Materials _____	3
DRC-W403.4	Workplace Health and Safety (WHS) _____	4
DRC-W403.5	Site Induction _____	4
DRC-W403.6	Traffic _____	4
DRC-W403.7	Protection of the Environment _____	5
DRC-W403.8	Noise _____	5
DRC-W403.9	Equipment Stuck in Conduits _____	5
DRC-W403.10	Qualifications _____	6
DRC-W403.11	Instrument Calibration _____	6
DRC-W403.12	Post Calibration Check _____	7
DRC-W403.13	Calibration Frequency _____	7
DRC-W403.14	Water Meter Compliance Testing _____	7
DRC-W403.15	Recording and Reporting _____	7

DRC-W403: CALIBRATION OF INSTRUMENTS

DRC-W403.1 SCOPE

This Specification applies to the calibration of instruments of the Principal's water supply and sewerage assets. Regular calibration of instruments is required to ensure accurate measurements and correct operation of instrumentation.

The work required to be performed under this Contract shall comply with the referenced documents in Clause DRC-W403.2, unless specified otherwise herein.

Details of the instruments to be calibrated and the required frequency of calibration will be provided by the Principal.

DRC-W403.2 REFERENCED DOCUMENTS AND STANDARDS

The following documents are referred to in this Specification. The latest version of the document including any published amendments shall apply. Where the drawings or a project specific specification are in conflict, or inconsistent with these referenced documents, or this Specification, then the details on the drawings or project specific specification shall apply.

Australian Standards

- AS 1199 Sampling procedures for inspection by attributes
- AS 2865 Confined spaces
- AS 3565.4 Meters for water supply – in-service compliance testing

Works shall also comply with the current versions all other relevant Australian Standards where not specifically listed above.

Water Services Association of Australia Standards

- WSA02 Gravity Sewerage Code of Australia
- WSA03 Water Supply Code of Australia
- WSA04 Sewage Pumping Station Code of Australia
- WSA11 Compliance Testing of In-service Water Meters Code of Practice

Other Standards and References

ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories

DRC-W403.3 LABOUR, PLANT AND MATERIALS

The Contractor shall provide, at its own cost and expense all labour, materials, plant, tools and equipment necessary for the proper and complete performance of the Contract.

DRC-W403.4 WORKPLACE HEALTH AND SAFETY (WHS)

All costs associated with ensuring a safe work environment for the implementation of the works shall be deemed to be included in the Tender price.

The Contractor shall ensure that in the performance of the Works, the Contractor's employees, sub-contractors and employees of such sub-contractors shall observe the statutory Safety Regulations and Site Conditions for Contractors.

Within 28 days of the Date of Acceptance and prior to the commencement of work, the Contractor shall submit to the Superintendent details of the Contractor's WHS Management System including a Hazard and Risk Assessment and a Safety Plan specific to the Contract covering all of the Contractor's activities for the duration of the Contract.

For works in confined spaces the Contractor is to conform to the requirements of the Work Health and Safety Act 2011 and AS 2865.

The Contractor shall provide medical treatment facilities and first-aid personnel to at least the minimum standards required by Workplace Health and Safety legislation.

As soon as possible following their occurrence, the Contractor shall report to the Superintendent any injuries likely to require medical treatment or involving lost time. In addition, the Contractor shall report to the Superintendent all injuries and near misses.

The Contractor shall manage and report all safety and security matters relating to his Sub-Contractors as if they were his own personnel.

Copies of the Safety Plan and records of all safety and security reporting over the duration of the Contract shall be held onsite, and be readily accessible for inspection by the Superintendent. The Superintendent shall carry out, from time to time, ad-hoc audits of the Contractor's safety systems on site. The Contractor shall attend all safety audits. The cost for participation in safety audits shall be included in the tender price.

DRC-W403.5 SITE INDUCTION

The Contractor may be required to undertake a Site Specific Induction for each site, performed by the Principal's representative. At the initiation of the Contract, the Contractor shall confirm which sites have a site induction requirement with the Principal. Where required, completion of the Site Specific Induction is a condition of the Contractor having access to the site.

DRC-W403.6 TRAFFIC

The Contractor shall carry out the work in such a manner as to minimise interference to the flow of traffic and pedestrians and shall comply with the standard Principal requirements.

Where work is required to be undertaken in the vicinity of an existing roadway, the Contractor shall develop and maintain a traffic management system that complies with the Transport for NSW (TfNSW) manual for *Traffic Control at Work Sites*, AS 1742, SAA HB81 and satisfies the requirements of the relevant road authorities. The Contractor shall submit the Traffic Management Plan to the relevant road authority and the Superintendent at least seven days prior to the commencement of works.

Traffic control and public safety devices are to be provided by the Contractor. Methods and devices are to comply with Australian Standards, WorkCover Authority requirements, RMS requirements, and any other relevant standards of practice.

The Contractor shall not divert traffic onto any temporary routes, or close any roadway, without prior written approval from the Superintendent.

Where traffic or parked vehicles make it impracticable or hazardous to carry out the work during normal working hours the Contractor may apply to the Superintendent for approval to perform the work outside of normal working hours.

DRC-W403.7 PROTECTION OF THE ENVIRONMENT

All work shall be carried out in such a manner as to avoid nuisance and/or damage to the environment. The Contractor shall comply with the requirements of the conditions of approval imposed by Council and the NSW Environment Protection Authority. No variation in costs or extensions of time will be considered due to these requirements.

Toxic chemicals shall not be used without the prior written approval of the Superintendent.

DRC-W403.8 NOISE

The Contractor shall conduct operations such that noise and other objectionable nuisances associated with the works are minimised. Where in the opinion of the Superintendent, operations are such as to warrant complaints on account of excessive noise or other nuisances, the Superintendent shall have the power to instruct that all work will cease until such time as the problem is rectified by the Contractor.

DRC-W403.9 EQUIPMENT STUCK IN CONDUITS

If any of the Contractor's equipment becomes stuck in a conduit such that it cannot be removed without excavation, the Contractor is to notify the Superintendent immediately upon becoming aware of the problem.

The Contractor shall be responsible for removal of any trapped equipment and shall wear all risks and bear all costs associated with the removal of the equipment. The Contractor is permitted to use his own or subcontracted resources for excavation and breaking into the conduit to retrieve equipment. Any conduit damaged by this operation is to be reinstated to the satisfaction of the Superintendent, and must be inspected by the Superintendent's representative prior to being backfilled. The Contractor shall restore all surfaces to the satisfaction of the Superintendent.

DRC-W403.10 QUALIFICATIONS

Laboratory testing and calibration shall be performed by a recognised testing laboratory accredited in the field of 'Measurement Science and Technology'.

Unless otherwise agreed by the Superintendent, all laboratory tests and field tests undertaken by the Contractor shall be performed by a Tester currently registered with the National Association of Testing Authorities (NATA) or equivalent authority for the class of tests being undertaken.

Other calibration and testing activities shall be undertaken by suitably qualified and experienced personnel in the particular activity being carried out.

DRC-W403.11 INSTRUMENT CALIBRATION

Instrument calibration is one of the primary processes used to maintain instrument accuracy. Calibration is the process of configuring an instrument to provide a result for a sample within an acceptable range. Instrument calibration shall be undertaken by the Contractor in accordance with the instrument manufacturer's recommendations and relevant standards.

Although the procedure varies for different instruments, the calibration process generally involves using the instrument to test samples of one or more known values. The results are used to establish a relationship between the measurement technique used by the instrument and the known values. These result can then be used to adjust the instrument to produce more accurate results in line with the known values. Following calibration the instrument can then provide more accurate results when samples of unknown values are tested.

The selected number of samples of known values to be tested, as part of the calibration process, shall be in accordance with the instrument manufacturer's recommendations or applicable standards. All test samples of known values shall be stored according to the manufacturer's instructions and shall be within any stated expiry date. The volume of any liquids/solutions used for the calibration shall be sufficient to cover both the probe and temperature sensor, or as recommended by the manufacturer.

Prior to calibration, all instrument probes and cable connections shall be cleaned and the battery checked in accordance with the manufacturer's recommendations. Failure to perform these steps can lead to erratic measurements.

If a multi-probe instrument is to be used, the Contractor shall program the instrument to display the parameters to be measured (eg temperature, pH, % dissolved oxygen, mg/L dissolved oxygen, L/s, etc).

DRC-W403.12 POST CALIBRATION CHECK

Following the initial calibration, the instrument's calibration may drift during the measurement period. The amount of drift that occurred after collecting the measurements is required to be determined. This check is performed by using the instrument to make a measurement of a test sample of known value which if appropriate may be the same sample used to originally calibrate the instrument. The check measurement result shall then be compared to the initial calibration value and compared to the drift criteria or post calibration criteria described in the Quality Assurance Plan or manufacturer's instructions. If the check value is outside the acceptable criteria for drift, the measurement data recorded using that instrument shall be qualified.

DRC-W403.13 CALIBRATION FREQUENCY

The frequency of calibration shall be as specified by the Principal, however as a minimum should be at least the frequency stated by the instrument manufacturer or relevant standard.

Where an instrument is not specifically required to be calibrated during the life of the instrument, as a minimum the instrument shall be checked for accuracy at least once per year.

DRC-W403.14 WATER METER COMPLIANCE TESTING

Compliance testing for in-service water meters shall be undertaken in accordance with the WSAA Code of Practice WSA11. To determine the accuracy of a chosen meter population, a statistically valid sample of meters shall be selected and submitted for laboratory testing in accordance with WSA11, AS 3565 and AS1199.

DRC-W403.15 RECORDING AND REPORTING

The results of calibration and testing of instruments shall be reported in a clear and unambiguous manner. Reports specific to the nature of testing and calibration activities and particular instruments involved shall be prepared by the Contractor and submitted to the Superintendent.

Reports shall include the following information:

- Name of calibration/testing organisation;
- Contract details of calibration/testing organisation;
- Accreditation scheme (eg NATA) where relevant to the calibration/testing organisation or laboratory;
- Accreditation number of the calibration/testing organisation where relevant;
- Identification of instrument including any asset/reference number, location, diameter and type or instrument;
- Details of the tests and/or calibration activities undertaken including procedure/method, standards and specific details such as date, flow, pressure, current or other relevant parameter;
- Results of the tests and/or calibration activities;
- Comments and observations; and
- Certification of calibration where relevant.

In addition, where an instrument has an equipment maintenance log, calibration details shall be recorded in this log. The logs should record both the frequency of calibration, as well as a mechanism of checking whether or not the calibration has drifted. Pre and post calibration values are recorded for each parameter where required.