

TRANSPORT FOR NSW (TfNSW)

QA SPECIFICATION Q2

QUALITY MANAGEMENT SYSTEM (TYPE 2)

NOTICE

This document is a Transport for NSW QA Specification. It has been developed for use with roadworks and bridgeworks contracts let by Transport for NSW or by local councils in NSW. It is not suitable for any other purpose and must not be used for any other purpose or in any other context.

Copyright in this document belongs to Transport for NSW.

REVISION REGISTER

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 1/Rev 0		New specification	GM, RNIC	29.01.04
Ed 1/Rev 1	Various 7.3, Table Q/A.1 E1.2 7.4.3 1.3, K5, L2.2.3, L3.1 K4 Annex Q/M	Minor editorial changes. Submission of Contractor's Documents to comply AS 4390 replaced by AS ISO 15489 New clause added Minor editorial changes. Survey must be in a uniform pattern New references added	GM, RNIC	11.06.04
Ed 1/Rev 2	Foreword 1.4, 7.5.1, Q/K, Q/M E1.2, L3.2, Q/F(xii)	New clause after Table of Contents Text referring to survey transferred to RTA G71 Minor editorial changes.	GM, RNIC	09.02.05
Ed 1/Rev 3	Foreword E1.4.4 L1	Foreword (Q5/Q7 to Q6) removed. "Construction Program" changed to "Contract Program".	GM, IC	09.11.06
Ed 1/Rev 4	Notice Global 1.4 7.5.5	"Notice" changed to "Guide Notes". Editorial changes to "Notice" to remove redundant statements and improve clarity Minor editorial changes to improve clarity "Conditions of Contract" defined to include any form of contract used in the contract. Words "identification" and "packaging" added	GM, IC	16.04.08

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
Ed 1/Rev 4 (cont'd)	Annexure Q/A, Table Q.2(b) Note Annexure Q/C, C2 E1.2 E1.4.1 E2.1 Annexure Q/L Annexure Q/M	“Superintendent” changed to “RTA’s Representative” “Design control” changed to “Design and development”. “8.2.4.3” changed to “8.2.4.2”. “the AS/NZS ISO 9000 series” changed to “AS/NZS ISO 9001”. References to “G36” and “G22” deleted. “RMP” changed to “Project Records”. Clause reference “8.2.4.1” changed to “L2.2.3”. Additional words “unless directed otherwise by the Principal” added References updated		
Ed 1/Rev 5	“Notice” Guide Notes, 1.3, Annex D & M	RTA PO Box and fax numbers updated. Reference to ISO 9001 updated.	GM, IC	30.04.10
Ed 1/Rev 6	8.3	Requirements for control of nonconforming product expanded. Hold Point details amended.	GM, IC	26.11.10
Ed 1/Rev 7	Global	References to “Roads and Maritime Services” or “RMS” changed to “Transport for NSW” or “TfNSW” respectively.	DCS	22.06.20
Ed 1/Rev 8	Annex A	Minor editorial and formatting changes to Table A.1.	SMCSp	03.06.21

GUIDE NOTES

(Not Part of Contract Document)

Specification Q2 is recommended for use on minor contracts of value below \$0.2m, and for subcontracts over \$0.1m that do not require TfNSW Prequalification or Registration.

Specification Q2 is written such that it is consistent with AS/NZS ISO 9001:2008 and the recommendations contained in HB90.3:2000.

Specification Q2 only requires Inspection and Test Plans, procedures to control nonconforming product and selected process control procedures nominated in Annexure Q/A. Since Specification Q2 only requires a basic quality management system implementation by the Contractor, the Principal should provide the additional services to ensure that adequate quality assurance is provided.

Specification Q2 must not be used for subcontracts requiring TfNSW Prequalification or Registration. For subcontracts requiring TfNSW Registration, Specification Q3 must be used.

Specification Guide NQ3, a guide to the use of Specification Q3, is available on TOPIC and can be used for guidance for those requirements specified in Specification Q2.



QUALITY MANAGEMENT SYSTEM (TYPE 2)

Copyright – Transport for NSW
IC-QA-Q2

VERSION FOR: DATE:

CONTENTS

CLAUSE	PAGE
FOREWORD	III
TfNSW Copyright and Use of this Document	iii
Revisions to Previous Version	iii
Project Specific Changes	iii
1 GENERAL.....	1
1.1 Scope	1
1.2 Structure of the Specification	1
1.3 System Not Formatted on AS/NZS ISO 9001:2008.....	2
1.4 Terms and Definitions	2
2 (NOT USED).....	3
3 (NOT USED).....	3
4 QUALITY MANAGEMENT SYSTEM	3
4.1 General Requirements	3
4.2 Documentation Requirements	3
5 MANAGEMENT RESPONSIBILITY	6
5.1 Management Commitment	6
5.2 Customer Focus	6
5.3 Quality Policy	6
5.4 Planning	6
5.5 Responsibility, Authority and Communication	6
5.6 Management Review	7
6 RESOURCE MANAGEMENT	7
6.1 Provision of Resources	7
6.2 Human Resources	7
6.3 Infrastructure	7
6.4 Work Environment	7
7 PRODUCT REALISATION	7
7.1 Planning of Product Realisation	7
7.2 Customer-related Processes	7
7.3 Design and Development.....	7
7.4 Purchasing	8
7.5 Production and Service Provision	9
7.6 Control of Monitoring and Measuring Devices.....	10
8 MEASUREMENT, ANALYSIS AND IMPROVEMENT.....	10
8.1 General	10
8.2 Monitoring and Measurement	11
8.3 Control of Nonconforming Product.....	13
8.4 Analysis of Data	14
8.5 Improvement.....	14
9 PRINCIPAL'S SURVEILLANCE AND AUDITS.....	15
9.1 General	15

9.2	Quality Management System, Process Quality and Product Quality Audits and Surveillance	15
9.3	Validation of Principal's Design.....	15
ANNEXURE Q/A – DETAILS OF WORK.....		16
A1	Project Specific Requirements.....	16
A2	Document Submission Requirements	16
ANNEXURE Q/B – MEASUREMENT AND PAYMENT		17
ANNEXURE Q/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS		18
C1	Schedule of Hold Points	18
C2	Schedule of Quality Records and Identified Records	18
ANNEXURE Q/D – PLANNING DOCUMENTS.....		19
ANNEXURE Q/E – RECORD KEEPING AND IDENTIFIED RECORDS		21
E1	Record Keeping	21
E2	Identified Records.....	22
ANNEXURE Q/F – SUBCONTRACT REQUIREMENTS		25
ANNEXURE Q/G – PRODUCT TRACEABILITY.....		26
ANNEXURES Q/H TO Q/J – (NOT USED)		26
ANNEXURE Q/K – SURVEY PROCEDURES		26
ANNEXURE Q/L – TESTING PROCEDURES		27
L1	Identification of Work Lots	27
L2	Testing Services.....	27
L3	Statistical Techniques	31
ANNEXURE Q/M – REFERENCED DOCUMENTS		36
LAST PAGE OF THIS DOCUMENT IS		36

FOREWORD

TfNSW COPYRIGHT AND USE OF THIS DOCUMENT

Copyright in this document belongs to Transport for NSW.

When this document forms part of a contract

This document should be read with all the documents forming the Contract.

When this document does not form part of a contract

This copy is not a controlled document. Observe the Notice that appears on the first page of the copy controlled by TfNSW. A full copy of the latest version of the document is available on the TfNSW Internet website: <http://www.rms.nsw.gov.au/business-industry/partners-suppliers/specifications/index.html>

REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW Q2 Edition 1 Revision 7.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

TfNSW QA SPECIFICATION Q2

QUALITY MANAGEMENT SYSTEM (TYPE 2)

1 GENERAL

1.1 SCOPE

The work to be executed under TfNSW Q2 (TfNSW Q) consists of:

- (a) Developing and implementing a basic corporate Quality Management System in accordance with nominated clauses of ISO 9001 (refer to TfNSW Q Clause 4.2.2.2);
- (b) Developing and implementing a PROJECT QUALITY PLAN to cover all Work Under the Contract, whether permanent or temporary both on-site and off-site (refer to TfNSW Q Clause 4.2.2.3);
- (c) Keeping Quality Records in accordance with TfNSW Q Clause 4.2.4.

1.2 STRUCTURE OF THE SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

1.2.1 Details of Work

Details of work are shown in Annexure Q/A.

1.2.2 Measurement and Payment

The method of measurement and payment is detailed in Annexure Q/B.

1.2.3 Schedules of HOLD POINTS and Identified Records

The schedules in Annexure Q/C list the **HOLD POINTS** that must be observed. Refer to Clause 1.4 for the definition of **HOLD POINTS**.

The Quality Records for the Contract and referenced documents listed in Annexure Q/C must be created, when applicable, and located as specified in Annexure Q/C.

The records listed in Annexure Q/C are **Identified Records** for the purposes of Annexure Q/E.

1.2.4 Planning documents

The PROJECT QUALITY PLAN must include each of the documents and requirements listed in Annexure Q/D and must be implemented.

In all cases where TfNSW Q refers to manufacturers' recommendations, these must be included in the PROJECT QUALITY PLAN.

1.2.5 Record Keeping

Records for the Contract, including quality, environmental, OHS and other management records must comply with Annexure Q/E.

1.2.6 Referenced Documents

Unless specified otherwise, the applicable issue of a referenced document, other than a TfNSW Specification, is the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 2350). For convenience, the full titles are given in Annexure Q/M.

1.3 SYSTEM NOT FORMATTED ON AS/NZS ISO 9001:2008

Where the Quality Management System documents are arranged differently to the format of AS/NZS ISO 9001:2008, include in the PROJECT QUALITY PLAN a matrix of how the Quality Management System addresses all the requirements of TfNSW Q and AS/NZS ISO 9001:2008.

1.4 TERMS AND DEFINITIONS

The definitions appearing in ISO 9000 and in ISO 9001 Clause 3 apply in the interpretation of the words and expressions appearing in the quality assurance provisions of the Contract (except where the context otherwise requires).

“**TfNSW Q**” appearing in the Contract documents means this Specification.

“**Conditions of Contract**” in this specification means either GC21 General Conditions of Contract, C41 Terms for Contracted Work (Minor Physical Works and Services), or any other form of contract that may be used for the contract.

Additionally, the following words and expressions appearing in the Contract have the meanings hereby assigned to them, except where the context otherwise requires:

“**Hold Point**”: a point beyond which a work process must not proceed without the Principal's express written authorisation;

“**Inspection records**”: the evidence of conformity specified in ISO 9001 Clauses 7.1 (d) and 8.2.4.

“**Inspection and test forms/ITP forms**”: the forms that accompany the Inspection and Test Plan (ITP) and that are used for recording inspection/test results (e.g. verification checklists). If the ITP contains the facility to record inspection/test results, the ITP will also be regarded as an “ITP form” (refer TfNSW Q Clause 8.1.1).

“**Project Testing**”: testing, including sampling, carried out on the Site, at concrete and asphalt batch plants, on aggregates and materials used for pavements and structures at off site locations and any other testing specified in Annexure Q/A to be Project Testing.

“**Witness Point**”: a point in a work process where the Contractor must give prior notice to the Principal and the option of attendance may be exercised by the Principal.

“**Work Under the Contract**”: the work which the Contractor is or may be required to execute under the Contract and includes all variations, remedial work, Constructional Plant and Temporary Work, design and documentation (TfNSW G2).

2 (NOT USED)

3 (NOT USED)

4 QUALITY MANAGEMENT SYSTEM

4.1 GENERAL REQUIREMENTS

Apply the following quality assurance practices to the Work Under the Contract:

- (a) ensure that purchased items conform to specification before incorporating them in the Works;
- (b) plan and control work processes;
- (c) plan and carry out inspection and testing (including identification and traceability) to verify that the work processes are effective and that all finished work complies with the Contract;
- (d) careful selection of subcontractors and confirmation that their work complies with the Contract;
- (e) where the Specifications require plans, procedures, methods and forms to be documented, use these documents in implementing the Quality Management System for the Contract;
- (f) acknowledge and rectify any nonconforming work and improve work processes to prevent recurrence of nonconformities;
- (g) keep orderly records to demonstrate that the Works comply with the Contract; and
- (h) improve procedures and work practices when opportunities are identified to minimise errors, waste and product nonconformities.

4.2 DOCUMENTATION REQUIREMENTS

4.2.1 General

Develop, implement and maintain a basic corporate Quality Management System in accordance with ISO 9001 (where specified) and TfNSW Q.

Those requirements in TfNSW Q that are additional to the requirements of ISO 9001 may be addressed within the corporate Quality Management System or in supplementary quality management system documentation applied to the Contract. Where documentation of procedures is called for, it is acceptable to document the procedures either individually or combined with other procedures depending on how you choose to structure your quality management system.

4.2.2 Quality Management System Documents

4.2.2.1 QUALITY MANUAL

The development of a QUALITY MANUAL is optional for this Contract. A Quality Manual needs to be maintained, implemented and submitted only if it forms part of the quality management system documentation that addresses the requirements of TfNSW Q.

4.2.2.2 Quality Management System Procedures

Document, maintain and implement procedures in accordance with ISO 9001 as part of the corporate Quality Management System to:

- (a) identify, collect, index, access, file, store, maintain and dispose of quality records (refer TfNSW Q Clause 4.2.4); and
- (b) identify, record, notify and control nonconforming products or services (refer TfNSW Q Clause 8.3).

Procedures required by this Specification that are additional to the requirements of ISO 9001 may be included in your general corporate quality management system procedures or as supplementary corporate quality management system procedures to be applied on TfNSW contracts. The latter may be incorporated as part of a proforma PROJECT QUALITY PLAN for TfNSW contracts, controlled within your corporate Quality Management System.

The PROJECT QUALITY PLAN or QUALITY MANUAL must describe or reference the applicable quality management system procedures required by this Specification and show their revision status. Quality management system procedures referenced in the PROJECT QUALITY PLAN must be readily accessible to project personnel at their work locations.

4.2.2.3 PROJECT QUALITY PLAN

Prepare the PROJECT QUALITY PLAN to inform and direct your personnel about the specific quality practices, resources, sequence of activities, controls and checks that you must implement during the Contract. Include or reference in the PROJECT QUALITY PLAN the documents listed in Annexure Q/D plus any additional information nominated in the specifications for inclusion in the PROJECT QUALITY PLAN.

Associated technical documents that must be submitted with the PROJECT QUALITY PLAN include:

- (a) Quality Manual and quality management system procedures, if applicable (refer TfNSW Q Clause 4.2.1). Submit only those documents that form part of the Quality Management System applicable to this Contract that are not contained in the PROJECT QUALITY PLAN;
- (b) Documentation to explain how each work process will be carried out under controlled conditions (refer TfNSW Q Clause 7.5.1); and
- (c) Inspection and test plans and ITP forms that will be used to verify that the Works comply with the Contract (refer TfNSW Q Clause 8.1.1).

4.2.2.4 Changes to the Project Quality Plan and Associated Documents

Immediately implement changes, where applicable, to the PROJECT QUALITY PLAN and corporate Quality Management System if the PROJECT QUALITY PLAN and associated quality management system documents:

- (a) do not adequately address the Specification requirements; or
- (b) are causing nonconformity; or
- (c) have to be revised as a result of an audit; or
- (d) no longer represent current and/or appropriate practice.

Advise the Principal promptly of any revisions to the PROJECT QUALITY PLAN or corporate Quality Management System and submit amended documentation detailing the revisions within 5 working days.

4.2.3 Control of Documents

Identify each part of the PROJECT QUALITY PLAN and associated quality management system documents with a unique issue number and issue date, and keep a list of who holds copies. When a document has to be changed, ensure that the issue number and issue date is upgraded and that it is re-issued to all listed holders, and that the superseded documents are recalled or endorsed as superseded.

4.2.4 Control of Records

The quality records must include all those shown in Annexure Q/E.

Implement a records management system in accordance with Clauses E1 and E2 of TfNSW Q.

Describe in the PROJECT QUALITY PLAN where the quality records shown in Annexure Q/E will be located and how they will be stored and maintained so they are readily retrievable, in facilities that provide a suitable environment to minimise deterioration or damage and to prevent loss of the records.

Make the quality records available to the Principal at all reasonable times. Where requested by the Principal, permit the Principal to make copies of quality records.

Prior to Completion, provide the Principal with any commissioning records and operation and maintenance manuals relevant to the Works.

Provide the Principal with copies of any quality records within 14 days of a request by the Principal.

4.2.5 Submission of Documents to Principal

Submit documents in accordance with Annexure Q/A Table Q/A.1, Table Q/A.2 and Table Q/A.3.

Within 35 days after the date of acceptance of tender, submit for consideration by the Principal controlled copies of the complete PROJECT QUALITY PLAN with relevant associated quality management system documents. The number of copies required is shown in Annexure Q/A Table Q/A.1.

Alternatively, where the quality management system is accessed electronically on site rather than by reference to hard copies, provide access for the Principal to the extent necessary for the Principal to fulfil the Principal's responsibilities under TfNSW Q.

Work involving design or requiring controlled conditions or inspection and testing must not commence until 14 days after submission of the PROJECT QUALITY PLAN (for each stage or complete) and associated quality management system documents unless otherwise agreed by the Principal.

When requested by the Principal for the purposes of audits, provide additional controlled copies of the QUALITY MANUAL, PROJECT QUALITY PLAN and associated quality management system documents. These documents will be returned to you when they are no longer required by the Principal.

5 MANAGEMENT RESPONSIBILITY

5.1 MANAGEMENT COMMITMENT

Your top management is to be actively involved in developing a corporate Quality Management System (to the extent specified in TfNSW Q) that will achieve efficient and effective management of projects in order to consistently produce satisfactory outcomes for customers.

5.2 CUSTOMER FOCUS

Refer TfNSW Q Clause 8.5.

5.3 QUALITY POLICY

Not mandatory.

5.4 PLANNING

Plan a corporate Quality Management System to the extent specified in TfNSW Q.

5.5 RESPONSIBILITY, AUTHORITY AND COMMUNICATION

The PROJECT QUALITY PLAN must:

- (a) nominate your Project Quality Representative who has the defined authority and responsibility for ensuring that the requirements of the PROJECT QUALITY PLAN and associated quality management system procedures are implemented and maintained on the project;
- (b) where the Project Quality Representative is not your designated corporate Management Representative indicate the relationship between the two persons; and
- (c) list the main responsibilities and authorities of personnel primarily responsible for upholding the quality management system provisions of the Contract, including responsibilities for:
 - (i) authorising corporate quality management system procedures;
 - (ii) receiving, in-process and final (or acceptance) inspection and testing (refer TfNSW Q Clause 8.1);
 - (iii) identifying/recording quality problems;
 - (iv) initiating/recommending solutions through designated channels;
 - (v) verifying implementation of solutions;
 - (vi) controlling further processing/delivery/installation of nonconforming product until deficiencies or unsatisfactory conditions have been corrected.

The Project Quality Representative must be available for contact by telephone at all times when work is being carried out and be available to attend meetings on site within 24 hours of written or spoken notice by the Principal.

5.6 MANAGEMENT REVIEW

Not mandatory.

6 RESOURCE MANAGEMENT

6.1 PROVISION OF RESOURCES

Determine and provide resources needed to implement the PROJECT QUALITY PLAN and to enhance the Principal's satisfaction by meeting the Principal's requirements.

6.2 HUMAN RESOURCES

Ensure that persons performing work have the appropriate education, training, skills and experience.

6.3 INFRASTRUCTURE

Determine, provide and maintain infrastructure needed to achieve product conformity.

6.4 WORK ENVIRONMENT

When planning work process controls in accordance with ISO 9001 Clause 7.5.1, consider whether the work environment could adversely impact on the quality of constructed work. If so, determine and manage the work environment needed to achieve product conformity.

7 PRODUCT REALISATION

7.1 PLANNING OF PRODUCT REALISATION

Document a Project Quality Plan that complies with the PROJECT QUALITY PLAN requirements in TfNSW Q.

7.2 CUSTOMER-RELATED PROCESSES

Determine the requirements of the Principal and ensure the specified requirements can be met.

7.3 DESIGN AND DEVELOPMENT

Ensure that design is undertaken by a suitably experienced and competent person in the following circumstances, as relevant:

- (a) temporary structures and the checking of permanent structures for construction loadings;
- (b) lifting devices for manufactured items;
- (c) any alternative permanent structure or structural component proposed by you;
- (d) concrete mixes for structures and pavements and asphalt mixes for permanent works;
- (e) traffic management, temporary roadways and detours; and

(f) permanent works where design is nominated in the Contract.

Control the design process in accordance with TfNSW Q Clause 7.4.

Comply with TfNSW Q Clause 4.2 and Annexure Q/A in the submission of your documents.

7.4 PURCHASING

7.4.1 Purchasing Process

Where a supplier or contractor is to carry out work or provide services that require process validation (refer TfNSW Q Clause 7.5.2), evaluate the supplier or subcontractor on their capability to perform process validation. Document the method and results of this evaluation in the PROJECT QUALITY PLAN.

7.4.2 Purchasing Information

Address the requirements of ISO 9001 Clause 7.4.2 and include the subcontract requirements identified in Annexure Q/F in subcontracts whenever they apply.

The quality management system requirements detailed in TfNSW Q apply to all subcontracted products and services procured as part of the Work Under the Contract. This includes work process control documents and inspection/testing documents required by TfNSW Q Clauses 7.5.1 and 8.1.1. Include these documents in the PROJECT QUALITY PLAN. When planning surveillance of subcontractors, review the documents submitted by each subcontractor to ensure that all process control and inspection/testing requirements from the Specifications are adequately addressed.

Where any subcontractor is required to have TfNSW Prequalification or Registration, the subcontractor must use its quality management system that must conform to the quality management system requirements of the specified TfNSW Prequalification or Registration Category.

When a copy of a Subcontract is provided in accordance with the Conditions of Contract, include associated reference data (except price) and the applicable subcontract requirements listed in Annexure Q/F. When requested by the Principal, also submit an evaluation of the subcontractor's ability to meet subcontract requirements.

7.4.3 Verification of Purchased Product

Comply with TfNSW Q Clause 8.1(a) when receiving products from suppliers.

Include in the PROJECT QUALITY PLAN the subcontractors' PROJECT QUALITY PLAN or process control documentation used to control processes and to verify purchased product.

Plan the extent of surveillance to be exercised for each subcontractor including management of information and records generated by subcontractors. When planning this surveillance, review the documents submitted by each subcontractor to ensure that all process control and inspection/testing requirements from the Specifications are adequately addressed. The surveillance process must include how nominated HOLD POINTS will be released and other activities to verify that the subcontractor's output complies with the Principal's quality requirements.

7.4.4 Use of Purchased Products

Ensure that purchased products are compatible with the other products and works and are handled, stored, combined with other products, installed and used in accordance with the manufacturer's recommendations.

7.5 PRODUCTION AND SERVICE PROVISION

7.5.1 Control of Production and Service Provision

Prepare work process control documents that describe how to implement and monitor the controlled conditions for work processes listed in Annexure Q/A Table Q/A.3. Consider the following (as appropriate) when planning work process controls:

- (a) sequence of operations;
- (b) types of equipment required, capability, maintenance, calibration;
- (c) any special working environment aspects;
- (d) competency and skills of personnel;
- (e) work methods and materials to be used;
- (f) product characteristics, tolerances and workmanship standards to be met;
- (g) inspection, test and control points;
- (h) how the process will be monitored to ensure its continuing suitability;
- (i) records to be kept as evidence that the work process controls remain effective; and
- (j) defining responsibility for implementing and monitoring work process controls and rectifying any deficiencies.

Include the work process control documents in the PROJECT QUALITY PLAN (refer TfNSW Q Clause 4.2.2.3).

Treat and carry out survey as a separate application of work process control in accordance with TfNSW G71.

7.5.2 Validation of Processes for Production and Service Provision

Identify in the PROJECT QUALITY PLAN any work processes (including subcontracted work) where the resulting output cannot be verified by subsequent monitoring and measurement. In such cases, control of the work processes must be documented to indicate operator qualifications, equipment controls, method for validating process parameters and records to be kept.

Use these process validation controls to validate applicable work processes.

7.5.3 Identification and Traceability

Subdivide Work Under the Contract into Lots or discrete work areas and control work in accordance with Annexure Q/L. Document in the PROJECT QUALITY PLAN the method(s) for subdividing the work into Lots or discrete work areas and for allocating Lot numbers (refer TfNSW Q Annexure Q/L Clause L1) to uniquely identify each Lot.

The Principal has the right to reject a Lot that is visually non-homogeneous and/or non-representative.

Identify all samples and test results with the field locations and Lot number, as applicable, to which they relate.

Maintain a register that identifies every Work Lot established for the Contract.

Describe in the PROJECT QUALITY PLAN how traceability of the materials specified in Annexure Q/G will be maintained.

7.5.4 Customer Property

Take responsibility for safekeeping any materials or equipment supplied by the Principal for Work Under the Contract.

7.5.5 Preservation of Product

Employ methods of transport, identification, handling, packaging and storage on Site to prevent damage, deterioration or inappropriate use of materials and products used in the Works.

7.6 CONTROL OF MONITORING AND MEASURING DEVICES

Ensure that measuring and test equipment used to set out, construct or check the Work Under the Contract is maintained in calibration and good working order.

8 MEASUREMENT, ANALYSIS AND IMPROVEMENT

8.1 GENERAL

Plan and implement monitoring measurement and analysis processes under controlled conditions needed to demonstrate conformity of the product.

In demonstrating conformity of the product to specified requirements, carry out inspection and testing:

- (a) before any supplied product is used in the Works (receiving inspection and testing);
- (b) progressively during construction of the Works (in-process inspection and testing); and
- (c) as a final check that all inspection and testing necessary to demonstrate conformity of the Works to specified requirements has been carried out (final or acceptance inspection and testing).

Document in the PROJECT QUALITY PLAN a procedure that describes how to carry out, and who is responsible for, receiving, in-process and final inspection and testing and for closing out work Lots. Describe how to keep records of inspection and testing results.

8.1.1 Inspection and Test Planning

Document Inspection and Test Plans (ITPs) and ITP forms for all inspection and testing required by the Specifications. Include these documents in the PROJECT QUALITY PLAN (refer TfNSW Q Clause 4.2.2.3).

The ITPs and/or ITP forms must indicate:

- (a) who performs the receiving, in-process and final inspections or testing and at what stage of the work;

- (b) how the inspection or test is to be carried out and recorded (e.g. as a documented testing procedure or by reference to a Standard test method);
- (c) the acceptance criteria and frequency of inspection and testing. The detail for the acceptance criteria and frequency of inspection and testing and must replicate the nominated requirements of the Specifications. Reference to a specification clause alone is unacceptable;
- (d) who reviews inspection/test results, evaluates whether work conforms, determines what to do next if work does not pass a required inspection or test and closes out Work Lots;
- (e) when statistical analysis of test results is required (refer TfNSW Q Clause 8.2.4);
- (f) when nonconformity control is addressed (refer TfNSW Q Clause 8.2.4.2) including closing out Work Lots (refer TfNSW Q Clause 8.2.4.3);
- (g) who performs final review of all inspection/test results to confirm that all inspections and tests have been carried out to completely verify conformity for each Lot;
- (h) the time limits for testing, time constraints for submission, and Hold and Witness Points that are nominated in the Specifications; and
- (i) the requirements of TfNSW Q Clause 7.5.3 for Identification and Traceability and the sampling methods as required by TfNSW Q Clause L1.

8.1.2 Frequency of Testing

The frequency of testing must be appropriate to verify conformity and must not be less than that stated in the Specifications. Nominate appropriate frequencies even where no minimum frequency of inspection or testing is stated in the relevant Specification.

The Principal may conditionally agree to a proposal to reduce the specified minimum frequency of testing by up to 50% or as defined in the relevant Specification. The proposal must be supported by a statistical analysis verifying consistent process capability and product characteristics.

The specified minimum frequency of testing must be restored when a nonconformity is detected and until the Principal agrees to a new proposal to reduce the specified minimum frequency. The Principal may vary or restore the specified minimum frequency of testing, either selectively or permanently, at any time.

8.1.3 Inspection and Test Status

Describe in the PROJECT QUALITY PLAN, the method to be used for identifying and controlling the inspection and test status of all product and Work Under the Contract, including product and work which is incorporated in the Works prior to being verified as conforming.

If inspection/test records (such as a Lot register) do not clearly show the inspection and test status of each Lot or work area, Lots must be physically marked in the field to show whether they conform.

8.2 MONITORING AND MEASUREMENT

8.2.1 Customer Satisfaction

Refer to TfNSW Q Clause 8.5.2.

8.2.2 Internal Audit

Not mandatory.

8.2.3 Monitoring and Measurement of Processes

Review each work process control and the associated documents and inspections and tests while that work process is in progress to monitor whether the planned controls are effective in achieving product conformity.

8.2.4 Monitoring and Measurement of Product

Implement the Inspection and Test Plans for the project, as established in TfNSW Q Clause 8.1.1.

Where acceptance characteristics are described in the Specifications in terms of characteristic values, apply statistical techniques to analyse test results in accordance with Annexure Q/L Clause L3 (refer TfNSW Q Clause 8.1.1(e)).

Document and maintain a method to confirm that all products or work Lots requiring inspection and/or testing are so inspected and/or tested (refer TfNSW Q Clause 7.5.3) at the required testing frequency. Include this method in the PROJECT QUALITY PLAN or ITP documentation.

Arrange sampling and testing to be performed in accordance with Annexure Q/L.

8.2.4.1 Hold Points

Describe in the PROJECT QUALITY PLAN the method of arranging for the release of HOLD POINTS by the Principal.

Do not proceed beyond a HOLD POINT until the Principal has released that HOLD POINT. Make suitable arrangements to notify the Principal when a HOLD POINT will be reached.

8.2.4.2 Inspection and Test Records

The inspection, test and verification records for each Lot or work area (refer TfNSW Q Clause 7.5.3) must:

- (a) clearly show or reference the actual results obtained for any inspection and/or test and demonstrate conformity with the specified requirements;
- (b) be progressively maintained as results are achieved; and
- (c) indicate that control of nonconformity is addressed.

Make inspection, test and verification records available for evaluation by the Principal. Inspection and test records which are to be held on site (refer Annexure Q/A) must be stored in a room reasonably accessible to the Principal with facilities for the inspection of the records. Access must not be limited by your other management activities.

8.2.4.3 Close-out of Work Lots and Release of Products

Work Lots must not be closed out nor product released, dispatched, used or installed until you have fully verified their conformity and incorporated the required inspection and/or test results/reports, including the documentation referred to in TfNSW Q Clause L2.2, into your records.

Work Lots and products must not be covered up until their conformity has been fully verified, except as permitted below in this Clause.

The Principal recognises that some specified compliance testing might take over 48 hours to complete. In such circumstances, Work Lots/products may be covered up before the Lot is closed-out, subject to the following conditions:

- (a) you document an effective traceability/closure method in the PROJECT QUALITY PLAN that nominates the person or position responsible and describes how work or product that may need to be covered up will be identified, traced, recorded and promptly verified and what action will be taken if full conformity is not achieved;
- (b) you apply the traceability method on each occasion that a work Lot or product is covered up under such circumstances;
- (c) any specified verification survey has demonstrated conformity before covering up the work;
- (d) you demonstrate on the basis of past work that it is highly unlikely that the work will fail to pass the specified compliance testing; and
- (e) you apply the closure method and only close out the Work Lot after verifying that the work or product has passed the specified compliance testing.

Where product or work fails to pass any inspection and/or test, the Work Lot must not be closed out until the nonconformity has been rectified and closed out in accordance with TfNSW Q Clause 8.3.

8.3 CONTROL OF NONCONFORMING PRODUCT

Document a corporate quality management system procedure to address ISO 9001 Clause 8.3. Prepare a standard form for use as a Nonconformity Report.

Describe in the PROJECT QUALITY PLAN how the additional requirements of TfNSW Q Clause 8.3 will be implemented for the Contract.

Identify and control all products or services that fail to pass any inspection or test in accordance with the defined acceptance criteria. Where conformity may be achieved by simple reworking or repair (that is, without reference to the Principal), record the required action in a format to suit your continual improvement procedures (refer TfNSW Q Clause 8.5).

Where conformity cannot be achieved by simply reworking with the original process, notify the Principal of the nonconformity and record it on an appropriate register. Products that may be or are accepted with specified or predetermined deductions are nonconformities.

Submit a Nonconformity Report within 2 working days of detection of the nonconformity indicating the proposed rectification method, the calculations of any specified deductions, and when the rectification is to be undertaken.

If surveillance or an audit by the Principal indicates a nonconforming product that has not been addressed by a Nonconformity Report, the Principal will issue a 'Nonconforming Product Notification'. This nonconforming product must be dealt with in the same manner as if you had identified it.

For any nonconforming product, do not proceed with the rectification work, or cover up or further build on it until the proposed rectification method has been accepted by the Principal or a concession for its use has been given by the Principal. In evaluating the proposed rectification method or the request for a concession, the Principal may require additional supporting information, such as

engineering calculations or the opinion of a recognized technical expert in the field under consideration.

Acceptance of the proposed rectification method will be at the discretion of the Principal. The costs of the rectification work and any associated delays will be borne by you.

HOLD POINT

Process Held:	Implementation of rectification work.
Submission Details:	Proposed rectification method for nonconforming product, and additional supporting documentation where required by the Principal.
Release of Hold Point:	The Principal will consider the submitted documents and may inspect the nonconforming work prior to authorising the release of the Hold Point.

8.4 ANALYSIS OF DATA

Not mandatory.

8.5 IMPROVEMENT

8.5.1 Continual Improvement

Implement continual improvement in accordance with Clause 4.2.2.4.

8.5.2 Corrective Action

Comply with TfNSW Q2 Clause 4.2.2.4 when any deficiencies in the PROJECT QUALITY PLAN or corporate quality management system are detected.

Establish and maintain a Corrective Action Register to record a summary of corrective actions or list those records that demonstrate corrective actions.

If surveillance or an audit by the Principal indicates that the Quality Management System does not comply with the provisions of the Contract or that a condition adverse to quality exists, the Principal may issue a Corrective Action Request.

Rectify any nonconformity or condition adverse to quality notified by the Principal. Take corrective/preventive action to prevent recurrence of the nonconformity or remove the condition adverse to quality and return the completed Corrective Action Request, all within 7 days after the Corrective Action Request is given to you.

Address the Corrective Action Request in accordance with your arrangements for handling customer complaints as required by ISO 9001 Clause 7.2.3(c).

HOLD POINT (Where required by the Principal)

Process Held:	The Process referred to in the Corrective Action Request.
Submission Details:	Details of the corrective action.

Release of Hold Point: The Principal will consider the submitted documents prior to authorising the release of the Hold Point.

Enter details of the developed corrective action onto the Nonconformity Report or Corrective Action records, as appropriate.

8.5.3 Preventive Action

Not mandatory.

9 PRINCIPAL'S SURVEILLANCE AND AUDITS

9.1 GENERAL

All testing by the Principal associated with surveillance and audits will be conducted by a laboratory with NATA accreditation for the test methods specified. The results of such testing will be recorded on NATA endorsed test reports. If NATA has not accredited a laboratory for a test, the test must be carried out at a laboratory approved by the Principal.

9.2 QUALITY MANAGEMENT SYSTEM, PROCESS QUALITY AND PRODUCT QUALITY AUDITS AND SURVEILLANCE

Quality management system audits by the Principal may be conducted on a scheduled basis on all aspects of the Quality Management System and will be performed in accordance with recognised audit procedures.

The Principal will give at least 5 days notice that a quality management system audit is to be conducted.

Surveillance, process quality audits and product quality audits by the Principal may be conducted at any time.

If surveillance or an audit indicates a significant nonconformity of a product or service, the Principal is entitled to conduct a quality management system audit at 24 hours notice to you.

Make suitable facilities available at the Site to accommodate an audit team of three persons. The costs of providing such facilities will be borne by you.

9.3 VALIDATION OF PRINCIPAL'S DESIGN

Provide records, access to the works and assistance for surveillance and audits conducted by the Principal to allow the Principal to carry out validation of Principal supplied designs.

The Principal will give you at least 5 days notice in writing of when an audit by the Principal for design validation will be carried out. The notice will nominate the design to be validated, the names of persons authorised to conduct the audit for design validation and the inspections and tests to be carried out by the auditors.

ANNEXURE Q/A – DETAILS OF WORK

A1 PROJECT SPECIFIC REQUIREMENTS

Clause	Description	Requirement
Annexure Q/C Clause C2	Site records more than 35 days old must be stored on Site:	Yes / No

Project Testing also applies to the following tests: (Annexure Q/L Clause L2.2.1)	
---	--

A2 DOCUMENT SUBMISSION REQUIREMENTS

Documents and records must be submitted in accordance with this matrix. Refer to the Specifications for full details of submission requirements.

Table Q/A.1 – Document and Record Submission Matrix

Document	Number of Copies to be Submitted				
	During tender review	First Stage	During contract		
	Sample on request (1)	14 days prior to use (2, 3)	For review on request	On Completion	During audits (4)
Quality Manual if available; otherwise applicable quality management system procedures	1 ^(5, 6)	1 ^(5, 6)	–	–	1
PROJECT QUALITY PLAN	–	2	–	–	1
Process control procedures	1	2	–	–	1
Inspection and test plans and record forms	1	2	–	–	1
Quality records	–	–	(7)	(7)	(7)
Index of quality records	–	–	–	(8)	–

Notes:

- (1) Refer Table Q/A.2.
- (2) Also required within 35 days of acceptance of tender.
- (3) Also required 21 days prior to use if work involves design.
- (4) Copies will be returned on request.
- (5) The Principal may, on request from you, accept controlled copies of Quality Manual and/or applicable quality management system procedures that were submitted to Principal for a previously completed contract.
- (6) Where these documents contain additional information that is relevant for Work under the Contract but not already contained in the PROJECT QUALITY PLAN.
- (7) Copy must be provided for Principal's records as specified or as directed.
- (8) Prior to Completion (refer Clause E1.4.1).

Table Q/A.2 – Documented Procedures to be Submitted After Closing of Tenders:

The following documents must be submitted after the closing of Tenders within 5 working days of request, in accordance with the Request for Tenders:

Process and Location	Activities to be documented

Table Q/A.3 – Nominated Process Control Procedures:

You must document process control procedures for the following work processes (refer Clause 7.5.1)

Specification	Work process to be documented

Note:

- (1) Process control procedures for this Contract must include procedures, work methods and descriptions required by the specifications to be submitted to the Principal or included in the PROJECT QUALITY PLAN.

ANNEXURE Q/B – MEASUREMENT AND PAYMENT

The costs of testing by the Principal associated with audits or design validation will be borne by the Principal. The costs for all other activities associated with the planning, establishment, implementation and maintenance of the Quality Management System for this Contract including the costs of all investigation, testing, rectification and recording, as detailed in this Specification, must be included in the rates or prices generally in the Contract.

ANNEXURE Q/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

C1 SCHEDULE OF HOLD POINTS

Clause	Description
8.3	Implementation of rectification work
8.5.2	The Process referred to in the Corrective Action Request

Note: The imposition of a Hold Point is at the direction of the Principal.

C2 SCHEDULE OF QUALITY RECORDS AND IDENTIFIED RECORDS

The Quality Records and reference documents must include the following. Until Completion, the originals or copies must be at the following locations, unless otherwise agreed by the Principal. These records must be made available to the Principal.

Records located with the Principal (indicated by “R” in the table) are Identified Records for the purposes of TfNSW Q Annexure Q/E.

Site records more than 35 days old (if permitted in TfNSW Q Annexure Q/A) may be stored off site, but must be available on site within 24 hours of notice given by the Principal.

Clause	System Requirement	Required Record or Reference	Location
4.2.2	Quality Management System documents	PROJECT QUALITY PLAN, Quality Manual and quality management system procedures when applicable	S & R
4.2.3	Control of documents	List of who holds issued documents Register of current document issue/revisions	S S
7.3	Design and development	Design records	D & P
7.4	Purchasing	Evaluation of subcontractors and suppliers Surveillance, audit of subcontractors Subcontractor supplied documentation Certificate of testing by suppliers	P & S S P & S S
7.5.1	Control of production and service provision	Procedures describing how to control work processes Records demonstrating effectiveness of work process controls Records of process validation when applicable	P & R S S
7.5.3	Identification and traceability	Product batch/traceability records Lot Identification Register	S S
7.6	Control of monitoring and measuring devices	Calibration certificates	P

Clause	System Requirement	Required Record or Reference	Location
8.1.1	Inspection and test planning	Inspection and test plans	S & R
8.2.4.2	Inspection and test records	Records/checklists of inspection and testing Conformity reports for each completed Lot	P S
8.3	Control of nonconforming product	Nonconformity reports Principal's Nonconforming Product Notifications Nonconformity Register	S & R S & R P
8.5.2	Corrective action	Corrective action reports and Register Principal's Corrective Action Requests	S S & R

Legend of Document Location: D = Office of designer; R = Principal; S = Site; M = Office of Management Representative with executive responsibility; P = Principal place where the document is used.

ANNEXURE Q/D – PLANNING DOCUMENTS

The PROJECT QUALITY PLAN and its references must, as a minimum, include the following, when applicable.

Table Q/D.1 – PROJECT QUALITY PLAN

Clause	Required Planning Document or Reference
1.3	Matrix explaining the quality management system if it is not based on AS/NZS ISO 9001:2008
4.2.2.2	TfNSW specific procedures when they are not incorporated into the corporate system procedures
4.2.2.2	Description of applicable corporate quality management system procedures.
4.2.4	Description of how quality records will be stored and maintained
5.5	List of main responsibilities and authorities of personnel primarily responsible for quality assurance activities on this Contract
7.4.1	Document method and results of subcontractor evaluation for work processes that require process validation (when applicable)
7.4.2	Subcontractor's PROJECT QUALITY PLAN or process control documentation for each subcontract
7.5.2	Identification of work processes where the resulting output cannot be verified by subsequent monitoring and measurement
7.5.3	Method of maintaining traceability for materials listed on Annexure Q/G
7.5.3	Methods for subdividing the work into Lots and allocating Lot numbers
8.1	Procedure describing how to carry out and who is responsible for receiving, in-process and final inspection and testing and for closing out Work Lots, plus how to keep records of inspection and test results

Clause	Required Planning Document or Reference
8.1.1	Inspection and Test Plans, ITP Record Forms for all inspection and testing required by the Specifications
8.1.3	Method for identifying and controlling inspection and test status
8.2.4	Method for verifying that all inspection and/or testing is carried out at the required testing frequency
8.2.4.1	Method for release of Hold Points
8.2.4.3	Traceability/closure method for close-out of Work Lots
8.3	Additional requirements of TfNSW Q Clause 8.3
	Any other documents or information required by the specifications to be included in the PROJECT QUALITY PLAN

NOTE: Where the above documents are liable to change, they may be referenced in the PROJECT QUALITY PLAN and attached as an annexure to expedite their revision.

ANNEXURE Q/E – RECORD KEEPING AND IDENTIFIED RECORDS

Refer to TfNSW Q Clauses 1.2.5 and 4.2.4.

E1 RECORD KEEPING

E1.1 General

The work to be executed under Clauses E1 and E2 of TfNSW Q consists of:

- (a) Development and implementation of a procedure to create and keep records; and
- (b) Secure storage of project records and delivery of Identified Records.

E1.2 Record Keeping Definitions

The terms and definitions in ISO 15489.1 apply to TfNSW Q. In addition, the following definitions are applicable:

Project Record. Any record generated to document the execution of the project but does not include records which are commercial in confidence or relate to staff confidential matters.

Quality Record. A record used to demonstrate conformity to specified requirements and effective operation under AS/NZS ISO 9001 or required by TfNSW Q.

Identified Record. Any project record that is named as an Identified Record in the Contract.

E1.3 (Not Used)

E1.4 Project Records: Basic Record Keeping Requirements

E1.4.1 General

Project records include the following:

- (a) Quality Records as shown in Clause C2 of TfNSW Q;
- (b) Records of Environmental activities in accordance with TfNSW G36, Clause 3.11;
- (c) Records related to Work Health and Safety activities in accordance with TfNSW G22;
- (d) Contract Programs, as specified in the Conditions of Contract;
- (e) Identified Records that are a sub-set of the project records – see Clause E2 of TfNSW Q.

The project records must be:

- (i) sufficiently comprehensive to demonstrate compliance with Specifications. This includes subcontractor and supplier records, where relevant;
- (ii) accurate, legible and fully completed;
- (iii) kept in order, particularly in the case of multi-page records;
- (iv) filed in such a way that individual records can be readily retrieved;
- (v) filed promptly after they are generated or received;
- (vi) securely maintained to prevent unauthorised access, alteration, removal, deterioration, damage or loss;

- (vii) kept track of where authorised removal or transfer of records within the company is permitted; and
- (viii) entered on a register which shows what records are handed over to the Principal or sent to other parties, including the date and method of hand-over/dispatch.

Make all project records available to the Principal at all reasonable times. When requested by the Principal, permit the Principal to copy such records.

By Completion, provide the up-to-date index of all project records to the Principal. Following the provision of that index, provide copies of any project records within 14 days of a request by the Principal.

E1.4.2 Form of Records

Keep records as paper files or in electronic form unless otherwise provided in the Contract or agreed with the Principal.

Store records on media that ensure their useability, reliability, authenticity and preservation in accordance with the Contract.

E1.4.3 Storage

Store and maintain project records or copies thereof such that they are readily retrievable, in facilities that provide a suitable environment to minimise deterioration or damage, and to prevent loss.

Store project records:

- (a) Prior to Completion, at the location or locations specified in the Contract or, failing such specified location, at the principal place where the respective records are used or such other place as may be agreed with the Principal.
- (b) After Completion, at a location within the TfNSW Region in which the Work Under the Contract was carried out or at a location within the Sydney metropolitan area, as agreed with the Principal. Inform the Principal of the street address of the location. The location must not be changed without the approval of the Principal.

E1.4.4 Retention Period

Keep all project records for a minimum period of five years after Completion. This requirement continues to apply even though the records or copies of the records may have been given to the Principal and the Principal may have taken copies of the records.

E1.4.5 Disposal of Records

The records must be pulped, shredded or burned in industrial facilities when disposing of records after the expiration of the retention period. Dumping of project records is not permitted.

E2 IDENTIFIED RECORDS

E2.1 General

Deliver Identified Records to the Principal in accordance with Clauses E1 and E2 of TfNSW Q.

Each TfNSW Specification includes as an Annexure a list of Identified Records applicable to that Specification. Compile a list of all Identified Records for all TfNSW Specifications included in the Contract and include the list in the Project Records.

The Principal may direct, as a variation, that records be added to or deleted from the list. Deal with those records as Identified Records as from the time of receipt of the Principal's direction.

For the purposes of the definition of Completion in the Conditions of Contract, Identified Records which are then in existence, or must be in existence to comply with the provisions of the Contract, are deemed to be essential for the operation, use and maintenance of the Works.

E2.2 Form of Identified Records

Unless otherwise provided in the Contract or agreed with the Principal, all Identified Records must be delivered to the Principal in hard copy on paper size A3 or A4 in good quality file housing/covering except that work-as-executed drawings must be on paper size A2. The paper must be premium bond paper of minimum weight 80 grams per square metre. The colour must be white unless the record is normally maintained in some other colour for ease of identification when that colour may be supplied.

The use of thermal paper is not acceptable.

With the agreement of the Principal, Identified Records may be provided in electronic form if it can be demonstrated that:

- (a) the records have been properly captured into an electronic record keeping system and the records remain accessible, authentic, reliable and useable through any kind of system change during the period of Work Under the Contract and for the entire retention period; and
- (b) the records are compatible with TfNSW' electronic records management system.

E2.3 Filing and Indexing

File Identified Records as required to be prepared by the relevant TfNSW Specification. They must be uniquely numbered and filed in chronological order under the heading of the relevant TfNSW Specification by which they were created. Include an index for quick reference. Alternatively, you may submit for the Principal's approval an alternative means of filing and indexing which provides the information required by this Clause E2.3 and forms part of your standard record keeping system.

E2.4 Delivery

Deliver Identified Records to the Principal progressively during the course of the Contract at the times specified in the Contract or, if not so specified, at such times or within such periods as may be agreed with the Principal.

The Principal may withhold agreement of Completion until such time as all the Identified Records have been delivered. Make arrangements with the Principal for the delivery of any outstanding Identified Records.

In the event that the Principal elects to exercise the power conferred on him by the Conditions of Contract to terminate the Contract due to your default or insolvency or in the event that you, as a company, is being wound up voluntarily by its members for the purpose of reconstruction or amalgamation, all project records, including Identified Records, then in your possession become the property of the Principal forthwith and must be handed over to the Principal.

E2.5 Records to be Kept

Notwithstanding that project records and Identified Records have been delivered to the Principal or the Principal has taken copies of project records or Identified Records, retain the originals of those records or, where originals are not held by you, good quality copies of the records, for the period specified in Clause E1.4.4 of TfNSW Q.

Where electronic records are provided, keep a copy of those records in accordance with the provisions of TfNSW Q.

ANNEXURE Q/F – SUBCONTRACT REQUIREMENTS

Subcontracts provided to the Principal (refer to TfNSW Q Clause 7.4.2) must include the following, as applicable.

Subcontract Requirements	
(i)	Quality management system requirements which must be addressed by the subcontractor's quality management system;
(ii)	Method to be used for identifying purchased products (where required by Specifications);
(iii)	Verification requirements to be carried out by the subcontractor;
(iv)	Points in the subcontractor's Inspection and Test Plan(s) where you will verify conformity to contract requirements;
(v)	Hold Points and Witness Points to be observed by the subcontractor;
(vi)	Requirements for Principal's approval of the disposition of nonconformities;
(vii)	Requirements for the submission, retention and disposal of documentation, quality records and Identified Records;
(viii)	Identification and traceability requirements for work Lots and product, as specified in TfNSW Q Clause 7.5.3;
(ix)	Any specific requirements with regard to process control activities;
(x)	Requirements for the submission of inspection and test plans, procedures and record forms as specified by the Contract;
(xi)	Requirements for calibration of subcontractor's measuring and test equipment;
(xii)	For subcontract surveying services, requirements to comply with TfNSW G71;
(xiii)	For subcontract sampling/testing services, requirements to comply with Annexure Q/L.;
(xiv)	Right of the Principal to monitor, audit, inspect, test and sample subcontractor's quality management systems and plans, products, designs and activities and to inspect and copy records and report on the subcontractor's performance;
(xv)	Security of payment clauses of the Conditions of Contract where the subcontract exceeds \$25,000; and
(xvi)	Requirements for warranties in the name of the Principal.

ANNEXURE Q/G – PRODUCT TRACEABILITY

Refer to TfNSW Q Clause 7.5.3 – Apply traceability to the following products:

Specification	Product	Requirement
	Concrete batches used in bridge components, cast-in-place box culverts and retaining walls.	The trace must start at the batch plant and finish at the location where the material is incorporated in the Works. Records must be kept of the batch quantities and time, testing details and location of placement.
	Concrete batches used in road pavement sub-base and base.	The trace must start at the batch plant and finish at the location where the material is incorporated in the Works. Records must be kept of the batch quantities and time, testing details and location of placement.
	Stabilised material used in road pavement.	The trace must start at the batch plant and finish at the location where the material is incorporated in the Works. Records must be kept of the batch quantities and time, testing details and location of placement.
	Asphalt used in wearing courses, intermediate courses and drainage layers.	The trace must start at the batch plant and finish at the location where the material is incorporated in the Works. Records must be kept of the batch quantities and time, testing details and location of placement.
	Steel plate in bridge girders and bridge columns.	The trace must start at the steelworks and finish at the location of the plate in the girder or column. Records must be kept of the steel heat number, testing details and location of the plate in the girder or column.

ANNEXURES Q/H TO Q/J – (NOT USED)**ANNEXURE Q/K – SURVEY PROCEDURES**

Refer to TfNSW Q Clause 7.5.1. Carry out survey in accordance with TfNSW G71.

ANNEXURE Q/L – TESTING PROCEDURES

This Annexure provides details on the content of sampling and testing procedures to be included in the PROJECT QUALITY PLAN, when applicable.

L1 IDENTIFICATION OF WORK LOTS

Refer to TfNSW Q Clause 7.5.3.

Work Under the Contract must be subdivided into Lots or discrete work areas. A Lot must consist of a continuous portion of homogeneous and/or representative material or end product produced under essentially constant conditions. Discrete portions of a Lot that are visually non-homogeneous and/or non-representative must be excluded from the Lot and must be either treated as separate Lots or reworked to achieve conformity to the Specification.

The size of a Lot must not exceed one day's output except that this period may be extended by agreement with the Principal where full conformity cannot be achieved in one day.

Describe in the PROJECT QUALITY PLAN how the Lot is to be identified in the field.

Determine the bounds of each Lot before sampling. Set the bounds of each Lot so that each Lot is represented by a single tested sample, except where statistical methods (which require several tested samples to represent a Lot) are used. Each acceptance criterion may have different Lot boundaries. Demonstrate the relationship of the boundaries of all adjacent Lots to confirm that the Lots represent the total work.

Give each Lot a unique Lot number. Use this Lot number as an identifier on all quality records. The Lot numbering system must be compatible with any activity numbering system used for your Contract Program. Record the Lot number on an appropriate register that indicates the three-dimensional location of the Lot. Include in the PROJECT QUALITY PLAN details of the Lot numbering system and the place where the Lot register is kept. Record chainages of start and finish, lateral location and layer location. When the Lot number does not indicate the location of the Lot, agree the method for identification of the Lot with the Principal.

L2 TESTING SERVICES

L2.1 General

L2.1.1 National Association of Testing Authorities (NATA) Accreditation

Apply the requirements of Clause L2 to all laboratories verifying conformity of materials and work used for the Contract. Ensure that all suppliers and subcontractors required to use or supply tested materials or work are informed of and implement the requirements of Clause L2 and testing requirements in the relevant specifications.

If NATA has not accredited a laboratory for a test, the test must be carried out by a laboratory accredited for the test by an organisation mutually recognised by NATA and approved by the Principal. The test must be carried out and results endorsed in accordance with accreditation conditions or by a laboratory approved by the Principal with results reported in a format also acceptable to the Principal.

L2.1.2 Laboratory Independence

You and the laboratories used for the testing must ensure objectivity and impartiality in sampling, testing and reporting of results. The laboratories must act independently of you, any of your subcontractors and the Principal in conducting the sampling and testing.

Independence, for the purposes of this clause, means “management and personnel are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect quality of their work” (refer AS/ISO/IEC 17025 Clause 4.1.5(b)).

L2.1.3 Sampling Personnel

Sampling, including selection of locations, must be conducted by personnel either accredited by NATA for that sampling procedure or who are from a NATA accredited laboratory or approved by the Principal and who have been assessed as proficient for that sampling procedure and must be supervised by an officer having NATA signatory approval for that process.

L2.1.4 Test Certificates

Test results for each Lot must be reported in NATA endorsed documentation.

L2.2 Project Testing

L2.2.1 Project Laboratories

In addition to Clause L2.1, Clause L2.2 applies for all samples and tests carried out on the Site, at concrete and asphalt batch plants, on aggregates and materials used for pavements and structures at off site locations and any other testing specified in Annexure Q/A to be Project Testing.

Engage one or more Project Testing laboratories that hold NATA accreditation at your own cost.

As a condition of appointment by you (refer TfNSW Q Clause 7.4), laboratories, material suppliers or subcontractors who have NATA accreditation must provide to you and the Principal, on request, copies of NATA audits, relevant to the type of tests carried out for the Contract.

The Principal may forward to NATA, copies of test records, certificates, reports of surveillance, performance and audits of any laboratory used for sampling and testing the conformity of materials and work.

The same Project Testing laboratory responsible for testing the sample must undertake the sampling, unless otherwise approved by the Principal.

Should you propose sampling and/or testing by personnel other than from the laboratory, prior to sampling and/or testing commencing, submit a proposal for the Principal’s approval showing the sampling and/or testing to be performed, by whom, their experience and the measures to ensure the integrity of the sampling and testing. Ensure that the sampler has NATA accreditation for the specified sampling methods (where applicable) and understands the requirements for independent random and unbiased sampling. If NATA accreditation does not apply for any sampling or testing method, you must ensure that the sampler and/or tester is suitably trained and competent.

Should a Project Testing laboratory need to subcontract testing then, prior to sampling and testing commencing, submit a proposal for the Principal's approval showing the tests to be performed, by whom, their experience and the measures to ensure the integrity of the sampling and testing.

L2.2.2 Inspection and Test Plans

Provide the Project Testing laboratory with all information, including relevant parts of the Contract, Specifications, Inspection and Test Plans, and ensure that laboratory performs sampling and testing in accordance with the Contract.

Project Testing laboratories that provide on-site testing services must independently review your Inspection and Test Plans (and/or subcontractors) to confirm that:

- (i) all conformity tests are identified, and
- (ii) sampling and test methods, acceptance criteria and frequency of testing conform to the Contract and Specifications.

Any discrepancies must be resolved between you and the Project Testing laboratory and amended Inspection and Test Plans issued, where appropriate. The Project Testing laboratory must supply to the Principal, prior to commencement of any sampling and testing, a written report describing the outcome of this review.

L2.2.3 Selection of Sampling Locations

You must define the Lots for sampling and the Project Testing laboratory must select the sampling locations in accordance with the Contract and Specifications. Sampling must not be restricted to locations dimensioned or otherwise defined for setting out the Works in the Drawings or Specification, but must be undertaken in a random or unbiased manner at any location within the Works.

L2.2.4 Test Certificates and Declarations

The test report for each Lot (or sub-Lot) must include the following details:

- (a) Identification of work and materials with the relevant Lot number;
- (b) Where sampling is performed by personnel other than from the laboratory undertaking the testing,
 - (i) declaration from the sampler that the sampling was carried out in accordance with Annexure Q/L and the specified sampling methods. Detail all samples taken as part of the Lot.
 - (ii) declaration (in a format acceptable to the Principal) by an officer having NATA signatory approval for the testing performed, that the test results, and statistical analysis where applicable, conform with the specified criteria. This declaration must reference your Inspection and Test Plan and the sampler's declaration.
- (c) Where sampling is performed by personnel from the laboratory undertaking the testing, declaration (in a format agreed by the Principal) by an officer having NATA signatory approval for the sampling and testing performed, that the sampling was carried out in accordance with Annexure Q/L and the specified sampling methods, test results, and statistical analysis (where applicable), conform with the Inspection and Test Plan. This declaration must reference and indicate the issue number or date of the Inspection and Test Plan.

- (d) Declaration that no samples have been abandoned or untested, or details of any samples that have been abandoned or untested for any reason.

L2.2.5 Availability of Sampling and Testing Records

Sampling and testing records shown in Annexure Q/C2 to be held on Site must be stored in a room readily accessible to the Principal with facilities for inspection of the records. Access must not be limited by the laboratory's other management activities.

The laboratory, on request, must independently provide to the Principal, concurrently with submission to you, the test certificates and declarations in Clause L2.2.4, including preliminary results forwarded to you.

The Principal must be given physical access to sites and personnel in conjunction with or through you. Nominate a member of the Project Testing laboratory team to be the authorised contact person for communications with the Principal in sampling and testing matters. This person must be fully conversant with the relevant parts of the specifications, specified test methods, the test carried out and testing records and must promptly provide, when requested, information on testing and access to, or copies of, testing records including worksheets to the Principal.

L2.3 Protection of Sampled Work

Samples removed from the Work Under the Contract must be replaced, unless otherwise specified, with similar material placed and finished in accordance with the relevant specification requirements, within 7 days of sampling and prior to the use, deterioration, contamination or covering up of the sampled work.

L3 STATISTICAL TECHNIQUES

Use statistical techniques in accordance with the following sub-clauses where required in the Specifications. By agreement with the Principal, areas that are not generally rectangular may be notionally rearranged to suit the method of determining sampling locations in TfNSW Q Clause L3.1.

L3.1 Sampling and Testing

The number of samples per Lot (n) must be not less than:

Specified Relative Compaction (%)	Minimum Testing Frequency for Lot Area of:				
	> 5000 m ²	1000 - 5000 m ²	500 - 1000 m ²	50-500 m ²	≤ 50 m ²
≤ 90.0	1 per 3000 m ²	1 per 2000 m ² (min. 2)	1	1	1
> 90.0 ≤ 95.0	1 per 2000 m ²	1 per 1000 m ² (min. 3)	1 per 250 m ² (min. 3)	2	1
> 95.0 ≤ 98.0	1 per 2000 m ² (min. 6)	5	4	3	1
> 98.0 ≤ 100.0	1 per 2000 m ² (min. 6)	5	4	3	1
> 100.0	1 per 1000 m ² (min. 10)	1 per 500 m ² (min. 5)	4	3	1

NOTES:

1. Where the sampler/tester can assure that the work is homogeneous and has been carried out within the same day under homogeneous conditions, and:
 - (a) where the minimum specified compaction is below 100.0%, work in separate areas, up to a total area of 1000 m², may be considered as one Lot; or
 - (b) where the minimum specified compaction is below 98.0%, layers may be covered before testing and may be considered as one Lot, subject to the following:

Sum Total Area of layers:	< 100 m ²	101-500 m ²	501-1000 m ²
Maximum number of layers:	5	3	2
Maximum thickness of Lot:	600 mm	600 mm	600 mm
Minimum number of Tests:	1	2	3

The tests must be evenly distributed throughout the layers and areas of the Lot.

2. Lots less than 2 m wide must not be longer than 150 m.
3. Except as stated in 1(b) above or specifically allowed by the relevant specification, the Lot will only be one layer.

Sampling locations must be determined by the sampling personnel in a random or unbiased manner (refer TfNSW Q Clause L2.2.3) as follows, unless directed otherwise by the Principal:

- (a) Representing the Lot as a rectangle, subdivide the Lot lengthwise into equal-area sub-Lots in accordance with the number of samples selected (n);
- (b) Establish six equally spaced grid lines within the Lot, as illustrated in Figure Q/L.1;
- (c) Where the width of Lot is between 0.5 m and 2.5 m, the number of grid lines may be reduced such that the distance between adjacent grid lines (equally spaced) does not exceed 400 mm;

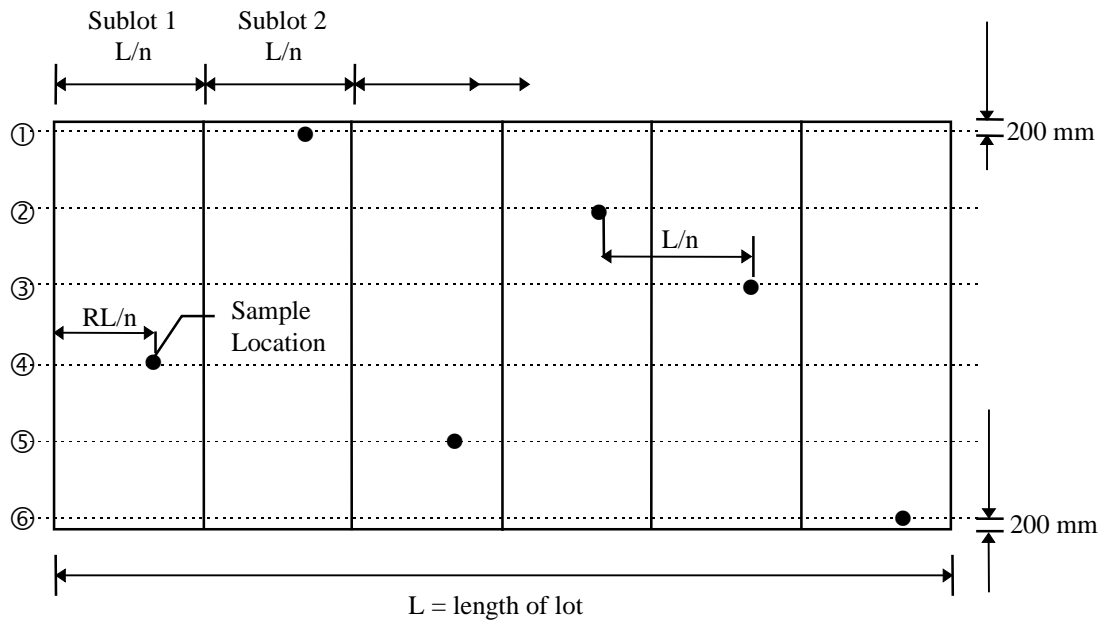


Figure Q/L.1 Sampling Locations for a Rectangular Lot

Table Q/L.1 — Random Grid Line Sequences (and Random Fraction R)

	A			B			C			D		
	Sequence	R	Lot No.	Sequence	R	Lot No.	Sequence	R	Lot No.	Sequence	R	Lot No.
1	531426	.91		245136	.01		532461	.25		425316	.17	
	634125	.15		641532	.46		431652	.95		613254	.38	
	165243	.96		265413	.29		124563	.76		352641	.32	
	452613	.61		236541	.49		324651	.84		546123	.30	
2	612345	.14		625413	.76		514236	.68		364251	.07	
	246135	.72		145632	.76		643215	.45		621534	.85	
	316245	.86		516342	.21		546312	.50		156243	.03	
	253416	.01		615243	.04		526413	.29		514326	.63	
3	342615	.95		162543	.70		263541	.69		145236	.63	
	352146	.85		624315	.43		435612	.01		412536	.97	
	245613	.38		526314	.02		356412	.23		614253	.01	
	451623	.08		631245	.13		163425	.07		652143	.11	
4	135624	.49		213465	.97		356142	.29		163254	.77	
	621354	.45		536214	.36		325461	.88		342165	.37	
	613425	.34		425136	.78		125463	.91		564231	.45	
	456321	.35		514623	.75		436251	.61		326451	.67	
5	245631	.44		214563	.43		124356	.45		325164	.83	
	516234	.52		425631	.23		536412	.64		246153	.08	
	462513	.83		645213	.86		653124	.32		516423	.94	
	532146	.83		531624	.19		453612	.93		125643	.54	
6	264531	.16		654132	.64		153462	.19		415236	.16	
	321456	.07		352416	.64		526431	.42		524163	.54	
	426135	.52		436125	.63		125436	.40		641352	.04	
	154632	.64		625341	.20		613452	.36		251436	.17	
7	512463	.13		362451	.16		125346	.12		136542	.09	
	264315	.85		251634	.99		431265	.10		132546	.18	
	453216	.15		136254	.72		425361	.79		145326	.74	
	532164	.12		523641	.85		614352	.02		245361	.76	
8	631524	.33		634521	.23		632154	.48		264351	.72	
	532614	.01		153264	.35		452316	.16		465312	.57	
	253641	.28		152634	.53		153642	.22		635412	.01	
	261453	.75		624135	.08		423561	.87		312645	.76	
9	235461	.68		532164	.63		652431	.90		516432	.88	
	654321	.19		415362	.05		613542	.64		461523	.31	
	614523	.13		316524	.48		463521	.66		236415	.92	
	361524	.51		432165	.54		621435	.39		346512	.43	
10	152643	.04		365142	.29		146253	.97		241365	.09	
	625314	.43		315624	.90		162354	.96		452631	.42	
	346251	.54		142356	.60		461352	.62		241356	.45	
	513246	.70		513624	.74		163542	.61		352614	.97	

L3.2 Method for Statistical Calculation for Conformity of Lots

When acceptance criteria specify a maximum and/or minimum characteristic value of attribute (Q), Q_U and/or Q_L must be used to determine Q .

The calculation of the characteristic value of attribute (Q) for the Lot must be as follows:

- (a) Sample Size = 1

$$Q_U = Q_L = \text{Test result}$$

- (b) Sample Size = 2

$$Q_U = \text{highest test result}$$

$$Q_L = \text{lowest test result}$$

- (c) Sample Size > 2

$$Q_U = \bar{x} + ks$$

$$Q_L = \bar{x} - ks$$

where \bar{x} = arithmetic mean of attribute test results for all sub-Lots

s = standard deviation of sub-Lot attribute test results

$$= \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

k = acceptance constant from Table Q/L.2 (based on 10% producer's risk)

Table Q/L.2 – Acceptance Constant k

Sample Size	3	4	5	6	7	8	9	10 - 14	15 - 19	20 +
k	0.52	0.62	0.67	0.72	0.75	0.78	0.81	0.83	0.90	0.95

A Lot achieves conformity if:

$Q_U \leq$ the specified upper limit for characteristic value of the attribute; and

$Q_L \geq$ the specified lower limit for characteristic value of the attribute.

If: Q_U is more than the specified upper limit for characteristic value; or

Q_L is less than the specified upper/lower limit for characteristic value,

and reworking is subsequently undertaken, the complete Lot must be resampled and retested to verify conformity.

ANNEXURE Q/M – REFERENCED DOCUMENTS

Refer to TfNSW Q Clause 1.2.6.

TfNSW Specifications

TfNSW G2	General Requirements
TfNSW G22	Work Health and Safety (Construction Work)
TfNSW G36	Environmental Protection
TfNSW G71	Construction Surveys

Australian Standards and Handbooks

ISO 9000	AS/NZS ISO 9000:2000, Quality management systems - Fundamentals and vocabulary
ISO 9001	AS/NZS ISO 9001:2008, Quality management systems - Requirements
ISO 15489.1	AS ISO 15489.1:2002, Records Management - Part 1: General
ISO/IEC 17025	General requirements for the competence testing and calibration laboratories
HB90.3	HB90.3:2000, The Constructions Industry Guide to ISO 9001:2000