



Construction Specification for Civil Works

CQS - Quality System Requirements

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GENERAL

CQS1 SCOPE

This Specification covers the requirements for the Quality, Safety and Environmental Management System requirements for the Works.

CQS2 PREAMBLE

The Constructor shall establish, implement and maintain Quality, Safety and Environment Management Systems. Armidale Regional Council (ARC) may direct these systems to conform to the following standards:

Standards

- a) Quality System in accordance with this Specification and the requirements of *AS/NZS ISO 9001*.
- b) Work Health and Safety Management System in accordance with this Specification and the requirements of *AS/NZS ISO 45001*.
- c) Environmental Management Systems in accordance with this Specification and the requirements of *AS/NZS ISO 14001*.

The Quality, Safety and Environmental Management Systems shall collectively be referred to as the Management Systems.

The Managements Systems, and any site-specific management plans, shall be used throughout the course of the Works to ensure that the quality of the Constructor's and any of their subcontractor's work complies with the requirements of the approved design drawings and the ARC Design and Construction Documentation. This shall apply to all work associated with the Works, both on site and off site.

Applicable to Work On and Off Site

Design and Construction Documentation associated with the Works consists of:

- ARC Engineering Design Code
- ARC Construction Specifications for Civil Works;
- ARC Standard Drawings; and
- Approved Design Drawings and associated documentation (including Construction Certificate for Approved Developments).

Design and Construction Documentation

Notwithstanding any statements to the contrary in the Constructor's Management Systems or Management Plans, no part of the Constructor's Management Systems shall be used to pre-empt, preclude or otherwise negate the requirements of any part of the Design and Construction Documentation associated with the Works. The Constructor's Management System requirements shall be used as an aid in achieving compliance with the approved Design and Construction Documentation associated with the Works. In no way shall they relieve the Constructor of its responsibility to comply with the Design and Construction Documentation associated with the Works.

Compliance with Design and Construction Documents

CQS3 REFERENCE DOCUMENTS

Documents referenced in this specification are listed in full below whilst being cited in the text in the abbreviated form or code indicated

Documents Standards Test Methods

Where not otherwise specified in the relevant Specifications or the approved design drawings, the Constructor shall use the latest versions of the Reference documentation, including amendments and supplements, listed in the Specifications at the time of the Works approval.

Currency

(a) Armidale Regional Council (ARC) Specifications

CQC – Quality Control Requirements.

ARC Specifications

(b) Australian Standards

AS/NZS ISO 9000	Quality management systems - Fundamentals and vocabulary.	Australian Standards
AS/NZS ISO 9001	Quality management systems – Requirements.	
AS/NZS ISO 10013	Guidelines for quality management system documentation.	
AS/NZS ISO 14001	Environmental Management Systems – Requirements with Guidance for Use.	
AS/NZS ISO 45001	Workplace Health and Safety Management Systems.	
AS/NZS ISO 19011	Guidelines for quality and/or environmental management systems auditing.	

(c) Safework NSW Publications

Code of Practice – "How to Manage Work Health and Safety Risks".	Safework NSW Publications
Code of Practice – 'Managing the Risks of Plant in the Workplace'.	
Code of Practice – 'Managing the Risks of Hazardous Chemicals in the Workplace'.	

(d) Other Publications

Handbook HB 90.3 The Construction Industry Guide to ISO 9001:2000.	Other Publications
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(e) Legislation

Work Health and Safety Act (2011).	Legislation
Work Health and Safety Regulation (2017)	
Protection of the Environmental Operations Act (1997)	

CQS4 DEFINITIONS

For the purpose of this Specification, the definitions as in *AS/NZS ISO 9000* and those below apply:

Constructor– Defined as the organisation responsible for construction of the Works and the Principal Contractor as defined in the *Work Health and Safety Act 2011*. **Constructor**

Constructor's Representative – Defined as follows:

- **Contracted Works** – the Principal Contractor's nominated representative as per the relevant contract. **Constructor's Representative**
- **Internal Works** – ARC officer responsible for delivery.

Corrective Action - Measures, including preventative measures, taken to rectify conditions which have caused or might cause nonconformity. **Corrective Action**

Corrective Action Request (CAR) - A formal advice/instruction from the ARC Representative and/or the Constructor's Representative regarding departures from the Quality System or Methods as approved in the Constructor's Quality Plan. Unless specifically noted, it will not require raising of a Non-conformance Report. **CAR**

Developer's Representative– Defined as the person or organisation appointed by the Developer to administer the Constructor responsible for the delivery of **Developer Infrastructure Works**. **Developer's Representative**

Disposition - Action to be taken to resolve non-conformance. (Lot Specific). **Rectification**

Environment - The physical factors of the surroundings of human beings including the land, waters, atmosphere, climate, sound, odours, tastes, the biological factors of animals and plants and the social factor of aesthetics.

Environmental Manual - A document setting out Environmental policies, procedures and practices of an organisation.

Environmental Management Plan (EMP) - Environmental documentation specific to the Works which is comprised of the Construction Environmental Management Plan with its job specific annexures, environmental work method statements and other site-specific documentation. **EMP**

Hazard - A situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.

Hold Point (HP) - A defined position in the construction/manufacturing stages of the Works beyond which work shall not proceed without mandatory verification and acceptance by the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works). **HP**

(NB: Each hold point nominates the ARC Representative and/or the Developer's Representative (for Developer Infrastructure Works) for release of the hold point).

The issue of a Non-conformance Report (NCR) or a Notice of Non-conformance (NNC) automatically creates a Hold Point.

Inspection and Test Plan (ITP) - The working document which identifies the specific inspections and tests to be carried out for specific work associated with the Works. **ITP**

Lot - A lot consists of any part of the Works which has been constructed/manufactured under essentially uniform conditions and is essentially homogeneous with respect to material and general appearance.

The whole of the work included in a lot shall be of a uniform quality without obvious changes in attribute values.

Management System Audit - An examination of the documented Management System and associated documents to evaluate their effectiveness in meeting the requirements of Legislation, Australian Standards and the Specifications.

Method Statement - A document that specifies the key steps and sequence in the manufacture/construction for an activity; what, how and by whom it shall be done; what materials and equipment shall be used to achieve the required quality standards.

Near Miss Incident - A near miss incident is where an incident has resulted in an injury or illness including loss time, medical treatment or First Aid treatment.

Non-conformance Report (NCR) - A mandatory (standard format) report submitted by the Constructor that details the non-conforming work and the Constructor's proposed disposition of addressing the non-conformance. **NCR**

Notice of Non-conformance (NNC) - Formal instruction from the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) regarding product non-conformance from that specified. It automatically creates a Hold Point and requires a Non-conformance Report from the Constructor. **NNC**

Performance Audit - An examination to evaluate whether established methods and procedures are being adhered to in practice.

Person Conducting a Business or Undertaking (PCBU) - Individuals, businesses or organisations that are conducting business in accordance with the *Work Health and Safety Act 2011*. **PCBU**

Product Audit - An assessment of the conformity of the product with the specified technical requirements.

Project Quality Plan - The Quality Assurance documentation specific to the Works which is comprised of the Constructor's Quality Manual with its job specific annexures, method statements, inspection and test plans and check lists. **PQP**

Quality Assurance - The management actions covering planning, quality control testing, inspection and verification procedures integrated with production to provide a product fit for the purpose.

Quality Assurance Representative - Appointed by ARC for the Works and responsible for the auditing, review and surveillance of procedures and documentation required by the Constructor's approved PQP.

Quality Check Lists - Forms completed during the manufacture/construction process verifying key steps, and records required for the Quality Register. Check lists apply to each identified lot of work.

Quality Management Representative (QMR) - Appointed by the Constructor for the Works with the authority and responsibility for the implementation and operation of the PQP and to ensure that Quality System requirements are not subordinated to design and productivity. **QMR**

Quality Manual - A document setting out the general quality policies, procedures and practices of an organisation.

Quality Register - The files containing all quality control records such as test results, completed check lists, certificates of compliance, consignment dockets for materials procured.

Quality System Requirements - The administrative activities affecting quality that need to be implemented and controlled to ensure that the product or a service meets specified quality requirements.

Risk - The possibility that harm (death, injury or illness) might occur when exposed to a hazard.

Risk Control - Means taking action to eliminate or minimise risks.

In relation to health and safety, the elimination of a workplace hazard would eliminate the risks associated with that hazard. If the risks cannot be eliminated, then they are to be minimised to a level 'so far as is reasonably practicable'.

Safe Work Method Statement (SWMS) - A Safe Work Method Statement is a document that outlines the high risk construction work activities to be carried out at a workplace, the hazards that may arise from these activities, and the measures to put in place to control the associated risks. **SWMS**

Safety Manual - A document setting out the safety policies, procedures and practices of an organisation.

The Works – Defined as follows: **The Works**

- **Developer Infrastructure Works** - work includes subdivisions and any public infrastructure work associated with an approved Development in the ARC local government area requiring a construction certificate.
- **Contracted Works** – infrastructure work undertaken by a Principal Contractor or subcontractor formally appointed by ARC and supervised by ARC.
- **Internal Works** - infrastructure work undertaken by ARC's day labour workforce.

ARC Representative – Defined as follows:

- **Developer Infrastructure Works** – Nominated ARC officer(s) for the approved Development.
- **For Contracted Works** – the Superintendent.
- **For Internal Works** – ARC Asset Owner.

ARC Representative

Work Health and Safety Management Plan - Safety documentation specific to the Works which comprises the Constructor's Safety Manual with its job specific annexures, method statements, inspection and test plans and check lists. **WHSMP**

Witness Point (WP) - A nominated position in the manufacture/construction stages of the Works where the option of attendance may be exercised by the ARC Representative and/or the Developer's Representative (for Developer Infrastructure Works), after notification of the requirement. **WP**

(NB: Each witness point nominates the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) for release of the witness point).

CQS5 ABBREVIATIONS

Abbreviations used in this specification are:

CAR	-	Corrective Action Request
CQS	-	Contract Quality System
CEMP	-	Construction Environmental Management Plan
EMP	-	Environmental Management Plan
HP	-	Hold Point
ITP		Inspection and Test Plan
NATA	-	National Association of Testing Authorities
NCR	-	Non-conformance Report
NNC	-	Notice of Non-conformance
PQP	-	Project Quality Plan
PCBU	-	Person Conducting a Business or Undertaking
QAR	-	Quality Assurance Representative (ARC)
QMR	-	Quality Management Representative (Constructor)
SRD	-	System Requirement Description
SWMS	-	Safe Work Method Statement
WHSMP	-	Work Health and Safety Management Plan
WP	-	Witness Point

QUALITY

CQS6 QUALITY MANUAL

The Constructor must have and maintain a Corporate Quality Management system that is consistent with the principles of the current *AS/NZS ISO 9001* or equivalent.

Unless directed otherwise by ARC, the Constructor's Quality Manual shall cover and include the requirements for Quality System Documentation as specified in *AS/NZS ISO 9001*, with guidance to preparation in *AS/NZS ISO 10013* and *Handbook HB 90.3 - The Construction Industry Guide to ISO 9001:2000*.

It shall incorporate all applicable System Requirement Descriptions (SRDs) with reasons for those not regarded as applicable. Additionally, it should include standard Method Statements and Inspection and Test Plans (ITPs) for the activities usually undertaken by the Constructor. It would be normal to have these in separate volumes. **SRDs**

CQS7 QUALITY PLAN

The Quality System requirements shall be incorporated in the Project Quality Plan (PQP). The Constructor's Quality Manual with its System Requirement Descriptions, standard Method Statements and Check Lists and the project specific components make up the site-specific PQP. **Content of PQP**

The Quality System and site-specific PQP shall be submitted for approval to the ARC Representative. Certain third-party certifications shall suffice as evidence that the Quality System complies with *AS/NZS ISO 9001*.

HOLD POINT

Hold Point

The PQP shall be submitted to the ARC Representative for acceptance at least fifteen (15) working days prior to site establishment at the Works site.

PROCESS HELD: Site Establishment

CQS8 ANNEXURES TO QUALITY MANUAL

The following details shall be provided by appropriate annexures to the Constructor's Quality Manual:

CQS8.1 Organisation Structure

The organisation structure for the management of the Works with details of the specific responsibilities and authorities of the nominated key personnel.

Structure

The Quality Management Representative (QMR), including this person's qualifications, technical experience and present position together with responsibilities and authorities to resolve quality matters.

QMR

The personnel or contracted testing organisations who will be conducting each type of compliance inspection or testing of completed work, their experience, qualification and responsibilities.

Personnel

The person(s) authorised to change construction processes on site.

Authority for Changes

CQS8.2 Addendums to System Requirement Descriptions (SRDs)

The SRDs in the Constructor's Quality Manual shall be augmented with suitable addendums to satisfy the requirements of this Specification.

Additional SRDs

CQS8.3 Register of Method Statements

A Register of Method Statements giving the title, identifier and revision status, shall be provided. This Register shall list all Method Statements that are to be included in the site-specific PQP for the Works and shall include any suitable Method Statements already incorporated in the Constructor's Quality Manual.

Content

JOB SPECIFIC REQUIREMENTS

CQS9 GENERAL

In the PQP, the SRDs in the Constructor's Quality Manual may need augmentation to cover the requirements of AS/NZS ISO 9001 and this Specification. This shall be provided in the form of suitable Annexures or where applicable included in the Method Statements or ITPs.

CQS10 METHOD STATEMENTS

Method Statements shall be provided for all activities scheduled in **Annexure CQS-B**. This requirement applies to all work associated with the Works including subcontracted work. The documentation shall cover, as applicable, planning, methods, verification and control.

Documentation

The presentation of Method Statements may be either descriptive, in the form of flow charts or a combination of both. In either case it must be accompanied by a Check List which shall include the relevant inspection and test points, surveying control points and Hold Points and the officer responsible to verify each check point.

Presentation

Where required, the Method Statements shall be site specific. The suitability of the site processes shall be validated during the Works.

System Audit

CQS11 DOCUMENT CONTROL	
<p>The site-specific PQP shall specify the method of keeping Quality Registers, tracking and handling of NCRs and NNCs and site correspondence.</p> <p>Unless directed otherwise by ARC, the requirements of <i>AS/NZS ISO 9001</i> shall be met.</p>	Records
CQS12 MEASURING AND TESTING EQUIPMENT	
<p>The site-specific PQP shall include the latest NATA advice of the terms of accreditation and current signatories for the facility which will be providing the compliance test reports.</p> <p>Inspection, testing and measuring equipment shall be capable of producing the precision and/or degree of accuracy specified in the referenced Test Methods and this shall be demonstrable by records of calibration.</p>	<p>NATA Registration</p> <p>Equipment Accuracy</p>
CQS13 PURCHASING	
<p>The quality assurance provisions detailed in this Specification shall apply to all subcontracted products or services for the Works.</p> <p>The Constructor shall ensure that the requirements of this Clause and unless directed otherwise by ARC, the requirements of <i>AS/NZS ISO 9001</i> are to be included in all such subcontracts.</p>	<p>CQS to Cover All Work</p> <p>Subcontracts</p>
CQS14 INSPECTION AND TEST PLANS	
CQS14.1 Documentation	
<p>The site-specific PQP shall include all inspections, tests and documentation necessary to ensure that work complies with the Design and Construction documentation associated with the Works.</p>	General Inclusions
CQS14.2 Sampling and Testing	
<p>All compliance inspections and tests shall be based on lots.</p> <p>The ITPs shall include details of the sampling methods. Sampling shall not be restricted to locations dimensioned or otherwise defined for setting out the Works in the approved design drawings or Specifications, but shall be undertaken in a random or unbiased manner at any location within the Works site to demonstrate its compliance with the Specification.</p> <p>The maximum lot sizes and minimum testing frequencies are listed in the Annexures to the relevant Specifications. Where no minimum frequency of testing, or maximum lot size is stated in the Specification, the ITPs shall nominate appropriate frequencies for the ARC Representative's approval.</p> <p>Where Test Methods are nominated in the Specifications, sampling and testing shall be carried out by a NATA accredited facility for those test methods and sampling procedures. Sampling shall be conducted by personnel from the NATA accredited facility for that sampling procedure and shall be supervised by the approved signatory from that NATA accredited facility. Test results shall be reported on NATA endorsed test documentation which shall include a statement by the approved signatory certifying that the correct sampling procedures have been followed.</p> <p>The responsibility for completion of inspections, tests and documentation shall be stated in the site-specific PQP.</p>	<p>Lots</p> <p>Random Sampling</p> <p>Lot Sizes Frequency of Testing</p> <p>Sampling and Testing</p> <p>Testing Responsibility</p>
CQS14.3 Hold Points (HP)	
<p>To assure compliance with the specified standards and requirements, mandatory HPs shall apply. HPs are those stages during the construction/manufacturing process where the Specifications require "approval by the ARC Representative and/or Developer's</p>	Approval to Proceed

Representative (for Developer Infrastructure Works)” or where a NCR or NNC has been issued with a corresponding HP. The Constructor shall not proceed past the HP until approval has been received from the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Work) to proceed.

To obtain the approval to proceed from the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works), the Constructor shall:

Requirements for Approval to Proceed

- Provide the information required by the Specifications;
- Ensure and certify that the particular lot/process is conforming;
- Ensure and certify that all underlying and adjacent lots affected by the lot in question are conforming; and
- Submit the appropriate form (Check List, NCR, NNC) at least 24 hours prior to the time the Constructor wished to proceed with the placement/construction of the next lot, unless some alternative arrangements have been agreed with the ARC Representative and/or Developer’s Representative.

CQS14.4 Content

As a minimum, the ITPs shall contain the following information:

Information to be Provided

- Item number/lot type references(s);
- Activity description;
- Specification requirements or where impractical, specification reference;
- Sampling method;
- Test method; and
- Test frequency.

CQS15 INSPECTIONS

Incoming inspections shall be required for deliveries of materials that will be subsequently included in one or more lots. When completing Check Lists for particular lots the inspection status shall be cited.

Incoming Materials

In-process and compliance inspections shall be completed by a responsible officer nominated in the Check List and certified by the QMR indicating that the work has been completed in accordance with the approved design drawings and Specifications.

Compliance Inspections

The Constructor shall establish and maintain a system to ensure and demonstrate that all products or parts of products requiring inspection and/or testing are so inspected and/or tested. The Constructor shall also establish and maintain a system for identifying the inspection status for all lots of work.

Inspection Responsibilities

CQS16 IDENTIFICATION

CQS16.1 Lots

All items of work shall be subdivided into lots.

Lots shall be chosen by the Constructor but shall be within the limits given in **Annexure CQS-C**. In general, the size of the lot shall not exceed one (1) day's output for each work process designated for lot testing.

Lot Size

Lot numbers shall be used as identifiers on all Quality System data.

Lot Numbers

The Constructor shall determine the bounds of each lot before sampling and shall physically identify each lot clearly. The physical identification of a lot shall be maintained until the Constructor has ensured that the lot has achieved the specified quality.

Lot Identification

CQS16.2 Lot Numbering

Each lot shall be given a unique lot number. The allocation of lot numbers shall be carried out by the Constructor to suit the circumstances, provided the lot numbering system complies with the following requirements:

Numbering System

- the lot number shall be entered in the Quality Register which shall provide at least the following information:
 - three-dimensional location of the lot (chainage of the start and finish points, lateral location and layer location) and/or the particular structure (e.g.: pier or abutment number, pour number);
 - indication of conformance or non-conformance;
 - summary of test results (e.g. characteristic value);
 - location of test sites, test identification numbers and test results; and
 - for nonconforming lot(s) a new number, or numbers, shall be allocated to the resubmitted/subdivided lot(s), but reference shall be maintained to the original lot number(s).

Non-conforming Lots

CQS16.3 Lot Identification

To ensure all site personnel can readily identify where the particular lots are in the field, the Constructor shall implement a field identification system which will clearly identify the bounds of each lot and the lot number. This identification system shall be detailed in the site-specific PQP and shall be maintained during all stages of construction of the lot.

Field Identification

The boundaries of a lot may be changed if subsequent events cause the original lot to be no longer essentially homogeneous. This will require appropriate notation in the Quality Register by the QMR.

Lot Boundaries

CQS17 IDENTIFICATION AND TRACEABILITY

The lot identification system, site records and sample numbering system shall allow test results to be positively identified with material incorporated in the Works. The identification and traceability systems should allow for traceability from the finished product back to incoming material records validating conformance.

Identification and Traceability

CQS18 SURVEYING CONTROL

Surveying Control shall be treated as a separate System Requirement and shall include all measurement, calculation and record procedures necessary to:

Requirements

- (a) set out the Works.
- (b) verify conformance to the approved design drawings and Specifications in relation to dimensions, tolerances and three-dimensional position.
- (c) determine lengths, areas or volumes of materials or products, where required for measurement of work.

The Method Statements for Surveying Control shall describe the process control parameters for special processes which cannot be fully verified by subsequent inspection and test.

The Constructor shall appoint qualified surveyors who are eligible for membership of the Institution of Surveyors, Australia or the Institution of Engineering and Mining Surveyors, Australia to supervise and take responsibility for all Surveying Control.

Surveyor Qualifications

The procedures and equipment used must be capable of attaining the tolerances nominated in the Specification.

Equipment

Sampling for conformance verification purposes shall not be restricted to the locations used to set out the Works.

Sampling Locations

The Constructor shall submit a Survey Conformance Report for each lot or component where design levels, position and/or tolerances have been specified. The Survey Conformance Report shall show 'specified vs actual' for position (defined by coordinates or chainage and offset), level and tolerance as appropriate and shall be certified by the qualified surveyor responsible for the verification survey.

Conformance Report

All survey records shall be included in the Quality Records and recorded in the Quality Register. Verification field book pages shall be clearly labelled, dated and signed by the surveyor with cross indexed references to equipment used, lot/component identification and associated Survey Conformance Reports. Where automatic data recording systems are used for verification surveys, a printout of both raw (field) data and reduced data shall be retained in a similar manner as conventional field books.

Quality Register

CQS19 RECORDS

The Constructor shall keep and maintain all Quality System records as required by Legislation, this Specification and unless directed otherwise by ARC, AS/NZS ISO 9001. They shall be systematically recorded, indexed and filed so as to be retrievable and accessible to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) and or an appointed Quality Auditor on a job basis within one (1) working day of requisition.

Quality Register

Conformance records shall be stored and maintained such that they are readily retrievable and in facilities that provide a suitable environment to minimise deterioration or damage and to prevent loss.

Storage

The Constructor shall make the quality records available to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) and at all reasonable times. If requested by the ARC Representative, the Constructor shall provide copies of the records or test results at no cost to ARC.

Accessibility and Copies

If requested by the ARC Representative, within one (1) month from the date of completion of the Works, the Constructor shall provide the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) with a copy of the Quality Register, or parts thereof.

Finalisation

The Constructor shall supply the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) progressively with advice in writing of any amendments to design details for inclusion in Work-As-Executed Drawings.

WAE

CQS20 NONCONFORMANCE AND CORRECTIVE ACTIONS

The workplace and work processes shall be subject to internal monitoring processes, with all non-conforming work detected by the Constructor's Quality System shall be reported to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) via a NCR within two (2) working days of being detected. NCRs shall be submitted with all records which indicate a departure from the requirements of the Design and Construction Documentation associated with the Works. The NCR shall indicate the proposed disposition.

NCR Within 2 Day

If the disposition of the non-conformance cannot be determined within one (1) working day, the Constructor shall submit a partially completed NCR identifying the non-conformance.

The non-conforming product shall not be covered up unless a disposition has been accepted/approved by the ARC Representative and implemented by the Constructor.

Disposition

Where non-conformance can be overcome by simply reworking the lot with the original process, a NCR will be required however a HP will not apply.

Reworking

With the exception of circumstances described above, a NCR will automatically create a HP which shall apply until conformance has been achieved and the ARC Representative has signed the Authorisation to Proceed.

Authorisation to Proceed

The Constructor's Representative and/or Developer's Representative (for Developer Infrastructure Works) will issue a Corrective Action Request (CAR) when the ARC Representative detects a non-conformance to the Constructor's Quality System or Methods.

CARs

Where the Developer's Representative and ARC Representative's inspections, surveillance or audits detect product non-conformance, the Developer's Representative and/or ARC Representative will issue a Notice of Non-conformance (NNC). The Constructor is required to submit an NCR in accordance with this Clause.

NNCs

The Constructor shall establish a suitable numbering and registration system for all NCRs and NNCs, including cross referencing as required.

**Register of
NCRs & NNCs**

The Constructor shall nominate a proposed disposition for any non-conformance within five (5) working days or shall show cause to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) for any further delay. Under no circumstances will the deliberation on disposition of a non-conformance justify any claim from ARC.

**Disposition in 5
Days**

CQS21 DISPOSITION OF NONCONFORMANCE

The Constructor shall advise the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) in the NCR of the proposed disposition of the particular non-conformance. This proposed disposition will constitute corrective action for the lot or lots referred to in the NCR and may comprise one of the following:

**Proposed
Disposition**

- (a) propose additional work to bring the lot up to the specified standard; or
- (b) replace all or part of the lot to bring it up to the specified standard; or
- (c) request utilisation of a lot for a reduced level of service if such a clause exists in the relevant Specification

Any proposed disposition shall be subject to the approval of the ARC Representative. Reworked/replaced lots shall be verified to conform to the specified requirements.

CQS22 CORRECTIVE ACTION

The Constructor will be required to indicate on the NCR corrective action appropriate to ensure that the PQP is effective in avoiding recurrence of the non-conformance and continues to be effective.

**Corrective
Action**

CQS23 STATISTICAL TECHNIQUES

Random sampling techniques shall be used for each lot for the control of compaction of each continuous layer of earthworks, flexible pavement and asphalt.

**Random
Sampling**

Annexure CQS-A defines the method to be used for determining test locations of random sampling in each lot.

Test Locations

For compaction control of processes other than layers of earthworks, flexible pavement and asphalt, the sampling procedure will be proposed by the Constructor in their Method Statement and will require the approval of the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works). In such cases, the samples shall be each considered to be representative and all test results will be required to meet the appropriate tolerances for the lot.

**Sampling
Procedure for
Compaction**

CQS24 AUDITS

The Constructor's Audit Schedule - Quality, Safety and Environmental shall be included in the site-specific PQP. Guidance for the requirements of the auditing process is given in *AS/NZS ISO 19011*.

Audit Schedule

The Audit Reports shall be provided to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) upon completion. Dispositions for any CAR's or NCR's shall be provided within ten (10) working days of the completion of the Audit.

Audit Reports

ARC reserves the right to conduct External Audits. Notification shall be received from the ARC Representative in relation to the type and scope of the External Audit to be undertaken. The Constructor shall ensure that all relevant staff are made available and access is provided to all areas of the Works site and all records pertaining to the Works site.

External Audits

HEALTH AND SAFETY

CQS25 GENERAL

Unless stated otherwise, the Constructor shall assume all responsibilities as the Principal Contractor for the Works and authorises the person to have management or control of the work and to discharge the duties under the *Work Health and Safety Act 2011 (WHS Act)* and *Work Health and Safety Regulation 2017 (WHS Regulation)*.

Principal Contractor

Under Part 2 – Health and Safety Duties of the *WHS Act*, the Constructor (as the Person Conducting the Business or Undertaking - PCBU) must ensure so far as is reasonably practicable the health, safety and welfare at work of all workers and anyone else who may be present at a work site including visitors. All workers must take reasonable care for his or her own health and safety and cooperate with the PCBU to provide a working environment that is safe and without risk to health.

Part 2 WHS Act

Effective safety management shall be achieved through demonstrated leadership and commitment by the Constructor. Adequate resourcing shall be provided to ensure all requirements of the WHS Legislation and this Specification can be met at all times during the Works.

Resourcing

Unless directed otherwise by ARC, adequate resourcing shall be provided to ensure all requirements of *AS/NZS ISO 45001* can be met at all times during the Works.

CQS26 SAFETY MANAGEMENT SYSTEM

The Constructor shall have and maintain a Safety Management System in accordance with the WHS Legislation, this Specification and unless directed otherwise by ARC, *AS/NZS ISO 45001*. In addition, all materials and resources from Safework NSW (refer www.safework.nsw.gov.au) shall be used to ensure the Constructor's Safety Management System reflects NSW industry standards.

Safety Management System

CQS27 WORK HEALTH AND SAFETY MANAGEMENT PLAN

The Constructor shall develop a site-specific Work Health and Safety Management Plan (WHSMP). The site-specific WHSMP must be developed and documented in accordance with Clause 309 of the *WHS Regulation* and the guidance material from Safework NSW incorporating site-specific safety requirements and Safe Work Method Statements (SWMS), which must adequately address all WHS issues particular to the Works site.

WHSMP

The Constructor's Safety Management System and site-specific WHSMP shall be submitted for review to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works). Certain third-party certifications may be considered as evidence that the Constructor's Safety Management System complies with *AS/NZS ISO 45001*. It is preferable that all SWMS for the Works to be undertaken are submitted with the site-specific WHSMP.

HOLD POINT

Hold Point

The site-specific WHSMP shall be submitted to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) for approval at least fifteen (15) working days prior to site establishment.

PROCESS HELD: Site Establishment

CQS28 MANAGEMENT RESPONSIBILITY

The responsibilities of all of the Constructor's senior management and Works staff must be outlined clearly in the site-specific WHSMP. The roles and responsibilities must meet the requirements of Part 2 – Health and Safety Duties of the *WHS Act* and include the names, qualifications and experience of the site staff.

Roles and Responsibilities

CQS29 COMMUNICATION AND CONSULTATION

The Constructor shall ensure that adequate communication and consultation is undertaken in accordance with Part 5 – Consultation of the *WHS Act* and the *WHS Regulation*. Furthermore, the Constructor shall ensure that the communication and consultation is inclusive of all management, workers (including subcontractors), stakeholders and other persons that may be present at the site. The site-specific WHSMP shall reflect these requirements and detail how this will be achieved and documented.

CQS30 SUBCONTRACTORS

It is the Constructor's responsibility to ensure that their subcontractors are provided with copies of all sections of the site-specific WHSMP that are relevant to the work to be performed by the subcontractor.

Subcontractors

Each subcontractor shall prepare a Subcontractor's WHSMP specific to the relevant work, site-specific considerations and the Constructor's documentation. The Subcontractor's WHSMP shall comply with the requirements of Clause CQS27 and the Constructor shall prepare a report for the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) that states that subcontractor's WHSMPs and SWMS have been reviewed by the Constructor.

Sub-contractor WHSMP

HOLD POINT

Hold Point

Constructor to submit a report stating that subcontractor's WHSMPs and SWMS have been reviewed and accepted. This report shall be submitted to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) at least five (5) working days prior to any subcontractor establishing on the Works site.

PROCESS HELD: Subcontractor Site Establishment.

CQS31 RISK MANAGEMENT

Risk Management is used as an integral process to assess and control risks. The Constructor shall develop appropriate documentation demonstrating that suitable risk management procedures are implemented. The *WHS Regulation* and the current version of the *Safework NSW Code of Practice – How to Manage Work Health and Safety Risks* shall be complied with.

Risk Management

The Constructor must take reasonable steps to eliminate the health and safety risks, or if this is not possible, minimise those risks so far as is reasonably practicable.

Reasonable Steps

The site-specific WHSMP shall incorporate a site-specific Risk Assessment and Risk Control Plan. The risk controls shall be developed in a hierarchy in accordance with the current version of the *Safework NSW Code of Practice – How to Manage Work Health and Safety Risks*.

Risk Assessment

Where the risk management process identifies high risk construction work, SWMS shall be prepared for each activity, considering the hazard / risk and the measures put in place to control the hazard/risk.

CQS32 TRAINING

All workers must be inducted to the site, the Constructor’s Safety Management System and the site-specific WHSMP. The induction shall include training related to hazards likely to be encountered on site, and the corresponding control measures.

Induction

Specific safety training which is relevant to the site shall be developed with this training provided to each of the workers associated with the site. Task specific training shall ensure the workers on site have adequate understanding of the tasks and instruction in relation to:

Specific Training

- The nature of the work to be carried out.
- The nature of the risks associated with the work.
- The control measures associated with the work or activities.

Adequate induction training in relation to the WHS Legislation shall be delivered to ensure all workers, including managers and supervisors, understand their duties.

Workplace training requirements must be regularly reviewed whenever there are changes to the tasks, processes, systems of work, plant and substances that may affect health and safety.

CQS33 PLANT AND EQUIPMENT

The Constructor must ensure that processes are in place and implemented for plant items associated with the Works. The risks associated with plant and equipment shall be managed in accordance with the WHS Legislation and the current version of the *Safework NSW Code of Practice – Managing the Risks of Plant in the Workplace*. Records required in accordance with this code shall be kept on site with the Safety Management Plan Records.

Plant and Equipment

Workers on foot may be at risk when they are working in the vicinity of plant. Emphasis shall be placed on isolating workers on foot from work zones where plant is operating. These risks shall be adequately addressed in the risk assessment, inductions, training and SWMS. Consideration should also be given to workers on foot in the Constructor’s Traffic Management Plan and associated Vehicle Movement Plan (where required).

Workers on Foot

CQS34 EMERGENCY & INCIDENT MANAGEMENT

Emergency procedures for each site shall be documented in the site-specific WHSMP. The procedures shall adequately describe the procedures, responses and responsibilities of key personnel. The contact details of all key personnel and emergency services contacts shall be prominently displayed at the Works site.

Incident management

The Constructor shall report all serious incidents, including serious near miss incidents to the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works) as soon as possible. In accordance with the *WHS Act*, the Constructor must give notice to SafeWork NSW of all notifiable incidents.

NCRs and Corrective Actions raised as a result of an incident shall be raised and resolved in accordance with Clause CQS20. Notifications or fines shall be provided to the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works) with an associated NCR or CAR to ensure there are adequate records in relation to the identification and close out of the Incident.

CQS35 CHEMICAL MANAGEMENT

The Constructor must ensure that processes are in place and implemented for the management of hazardous chemicals associated with the Works. The risks associated with hazardous chemicals shall be managed in accordance with the WHS Legislation and the current version of the *Safework NSW Code of Practice – Managing the Risks of Hazardous Chemicals in the Workplace*.

ENVIRONMENT

CQ36 GENERAL

A Construction Environmental Management Plans (CEMP) is generally developed to ensure that the environmental management practices that are followed during the construction stage are consistent with commitments made at the planning, assessment and approval stage. A CEMP is normally required for large projects and smaller works of an environmentally sensitive nature. For other small projects, environmental management may be sufficiently addressed by including risk-based controls and management activities, e.g.: erosion and sedimentation controls.

CEMP

At all times the Constructor shall exercise any necessary and reasonable precautions appropriate to the nature of the Works. Appropriate control measures shall be introduced to achieve minimal environmental impact.

Erosion and Sediment Control (ESC) shall be considered as part of the CEMP and shall be in accordance with *C211 - Erosion and Sedimentation Control*.

ESC

CQ37 ENVIRONMENTAL MANAGEMENT SYSTEM

Where the Constructor is required to have an Environmental Management System, it shall meet the requirements of this Specification and unless directed otherwise by ARC, *AS/NZS ISO 14001*.

CQ38 ENVIRONMENTAL MANAGEMENT PLAN

Unless directed otherwise by ARC, the Constructor must have and maintain a Corporate Environmental Management system that is consistent with the principles of *AS/NZS ISO 14001*.

Unless directed otherwise by ARC, the Constructor shall develop a site-specific CEMP for the Works in accordance with *AS/NZS ISO 14001*.

The Environmental Management System and CEMP shall be submitted for approval to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works). Certain third-party certifications shall suffice as evidence that the Environmental Management System complies with *AS/NZS ISO 14001*.

HOLD POINT

The CEMP shall be submitted to the ARC Representative and/or Developer's Representative (for Developer Infrastructure Works) for approval at least fifteen (15) working days prior to site establishment at the Works site.

PROCESS HELD: Site Establishment at the Works site.

Hold Point

CQS39 PLANNING & MONITORING

The Constructor shall refer to the Development Consent (where applicable), Environmental Assessment(s), the Design and Construction documentation associated with the Works and other related documentation to identify the environmental risks associated with the Works site. All control measures documented in the Development Consent and CEMP shall be applied at the Works site.

Works Approval

The Works which either require, or are subject to permits or licensing requirements (i.e.: Environment Protection Licence), shall be adhered to at all times. The conditions and associated monitoring and control measures shall be documented in the CEMP. A copy of all permits and licences shall be held at the Works site at all times.

Licenses and Permits

Monitoring of the Works site and the environmental control measures shall occur on a regular basis commensurate to the environmental risk or at intervals no more than one (1) month. Records shall be kept (i.e. checklists) detailing the performance.

Environmental Monitoring

CQS39.1 Environmental Risk Assessment

The Constructor shall assess the environmental risks associated with the Works and the Works site. The environmental risks are directly related to the construction activities that may have an impact on the environment, for example:

Environmental Risks

- Site access including waterway crossings.
- Operation of facilities (chemical storage, refuelling).
- Demolition.
- Out of hours work.
- Vegetation clearing and grubbing.
- Water use or extraction.
- Services and utilities relocation.
- Earthworks.
- Culvert and drainage work.
- Stockpiling of materials.
- Sealing and paving.

If high risk activities are identified which will potentially impact on the environment, control measures shall be documented and implemented to alleviate the environmental impact. The CEMP shall clearly identify how the proposed control measures will reduce the environmental risk to the nominated standard.

High Risk Activities

Guidance on the Works, implementation and maintenance of the CEMP can be found in the NSW Department of Planning and Environment *Guideline for the Preparation of Environmental Management Plans* (2004) and the Commonwealth Department of Environment and Energy *Environmental Management Plan Guidelines* (2014).

Guidance

CQS39.2 Resources and Responsibilities

The Constructor shall provide adequate resources to ensure their Environmental Management System and CEMP are effectively implemented for the Works. Person(s) responsible for the Works and implementation of the Environmental Management System and CEMP shall hold tertiary qualifications in Environmental Science, Environmental Engineering or equivalent.

The responsibilities of all senior management and site-specific Works staff must be outlined clearly in the CEMP. Unless directed otherwise by ARC, the roles and responsibilities must meet the requirements identified in *AS/NZS ISO 14001*.

Roles and Responsibilities

CQS40 COMMUNITY LIAISON AND COMPLAINTS

Local residents and businesses shall be notified of the Works and any associated changes which may affect them. Aspects such as access, excessive noise, extended working hours, disruptions to utilities etc. shall be clearly outlined in writing at least five (5) working days prior to the event. The communication shall clearly outline the impact, its duration, likely affect and a nominated contact who is able to respond directly to any of the residents or businesses concerns.

Community Liaison Requirements

A system for the receipt and handling of complaints shall be documented in the CEMP. Details of any complaints shall be provided to the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works) within 24 hours of the complaint being received and any actions taken to remedy the problem.

Environmental Incidents

CQS41 TRAINING

All workers must be inducted to the Constructor’s Environmental Management System and CEMP. The induction shall include training related to the relevant environmental issues, environmental risks and specific requirements in accordance with the Development Consent (where applicable), other licences and permits.

Induction

Specific environmental training which is relevant to the Works site shall be developed with training provided to each of the workers associated with the Works site. Task specific training shall ensure the workers on the Works site have adequate understanding of the tasks and instruction in relation to:

Specific Training

- The nature of the environmental risks associated with the work.
- The environmental control measures associated with the work or activities.

Adequate training in relation to the relevant environmental legislation shall be delivered to ensure all workers, including managers and supervisors understand their duties.

CQS42 ENVIRONMENTAL INCIDENT MANAGEMENT

Emergency procedures for each site shall be documented in the CEMP. The environmental procedures shall adequately describe the procedures, responses and responsibilities of key personnel. The contact details of all key personnel and emergency services contacts shall be prominently displayed at the Works site.

Emergency Procedures

Environmental Incidents shall be managed and reported by the Constructor as required by Part 5.7 of the *Protection of the Environmental Operations Act (1997)*. The ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works) shall be notified of any reportable environmental incidents as soon as is reasonably practicable and within 24 hours.

NCRs and Corrective Actions raised as a result of an environmental incident shall be raised and resolved in accordance with Clause CQS20. Notifications or fines shall be provided to the ARC Representative and/or Developer’s Representative (for Developer Infrastructure Works) with an associated NCR or CAR to ensure there are adequate records in relation to the identification and close out of the environmental incident.

ANNEXURE CQS-A – RANDOM SAMPLING**CQS-A1 GENERAL**

Random sampling of test locations shall be used to control relative compaction of each layer of:

- (i) earthworks
- (ii) selected material zone
- (iii) flexible pavement
- (iv) asphalt

which are generally rectangular in area.

CQS-A2 SAMPLING RATES

The number of samples (n) per lot shall be as indicated in the specific Specification Parts which are summarised in *CQC – Quality Control Requirements*.

CQS-A3 RANDOM SAMPLING LOCATIONS

Sampling locations within a lot for the control of relative compaction shall be determined as follows:

- (i) Representing the lot as a rectangle, sub-divide the lot lengthwise into equi-area sub-lots in accordance with the number of samples selected (n).
- (ii) Establish six (6) grid lines within the lot, as illustrated in Figure CQS-A2;
- (iii) Throw a die to select a number between 1 and 6. This determines which grid line to use for the sample location in sub-lot 1;
- (iv) Throw die to select a group (1-6) in Table CQS-A1;
- (v) Throw die twice to select two random numbers (between 1 and 6) for row and column in Table CQS-A1 and obtain random fraction R;
- (vi) Length co-ordinate for sample location in Sub-lot 1 = RL/n ;
- (vii) For sample location in next sub-lot:
 - Add L/n to previous length co-ordinate.
 - Add 1 (on a cycle of 6) to previous grid line.

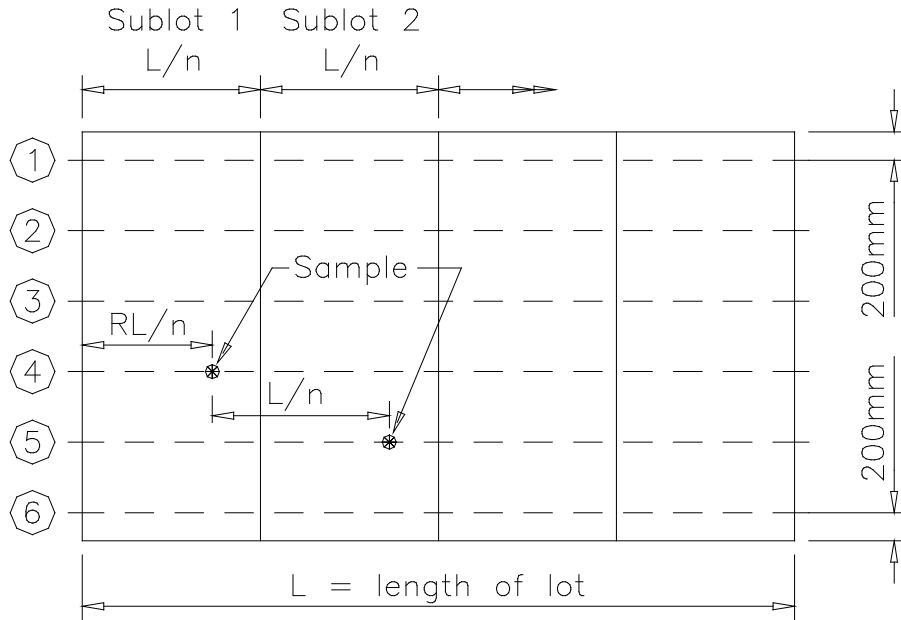


Figure CQS-A2 - Sampling Locations for Rectangular Lot

GROUP	ROW	COLUMN					
		(1)	(2)	(3)	(4)	(5)	(6)
(1)	(1)	0.78178	0.45467	0.00347	0.27296	0.00020	0.36517
	(2)	0.59678	0.67931	0.25434	0.59054	0.32444	0.41504
	(3)	0.14464	0.17269	0.61154	0.18291	0.83242	0.50776
	(4)	0.89010	0.44764	0.07451	0.20428	0.49513	0.91440
	(5)	0.91941	0.47726	0.33160	0.30670	0.65114	0.36852
	(6)	0.51085	0.38148	0.22169	0.66578	0.67050	0.69559
(2)	(1)	0.81891	0.48626	0.88892	0.82994	0.16941	0.81528
	(2)	0.37410	0.60232	0.12070	0.79017	0.32981	0.34908
	(3)	0.45921	0.15648	0.58052	0.37413	0.08124	0.97145
	(4)	0.86614	0.94719	0.78872	0.91972	0.45149	0.15107
	(5)	0.26590	0.41140	0.95477	0.81267	0.24018	0.07324
	(6)	0.95205	0.39438	0.73697	0.59427	0.71146	0.00575
(3)	(1)	0.18694	0.36502	0.17828	0.84312	0.57003	0.58583
	(2)	0.91211	0.86936	0.43030	0.27672	0.47393	0.10342
	(3)	0.80714	0.34295	0.00775	0.90855	0.33368	0.21842
	(4)	0.67579	0.92686	0.18005	0.00645	0.11256	0.05278
	(5)	0.03184	0.69876	0.16676	0.43346	0.86992	0.03275
	(6)	0.15623	0.02905	0.72763	0.19095	0.80847	0.39729
(4)	(1)	0.72109	0.17970	0.22505	0.35561	0.98935	0.27818
	(2)	0.37348	0.19381	0.43331	0.75033	0.99963	0.42232
	(3)	0.12129	0.32386	0.56705	0.87165	0.84460	0.92955
	(4)	0.54948	0.08844	0.47061	0.78419	0.18731	0.93485
	(5)	0.15097	0.44967	0.48759	0.84161	0.19212	0.05146
	(6)	0.32360	0.66850	0.99382	0.94050	0.96449	0.96217
(5)	(1)	0.68091	0.54191	0.10910	0.94237	0.23161	0.15167
	(2)	0.97121	0.83626	0.70896	0.45296	0.69475	0.11264
	(3)	0.19723	0.98260	0.57429	0.94789	0.64457	0.20809
	(4)	0.84036	0.14095	0.29451	0.40256	0.34521	0.64924
	(5)	0.97500	0.98056	0.82276	0.97130	0.77329	0.89855
	(6)	0.83244	0.30828	0.06882	0.68471	0.71081	0.91649
(6)	(1)	0.75892	0.29685	0.70044	0.91238	0.53356	0.45239
	(2)	0.13229	0.19701	0.36074	0.32254	0.62045	0.26691
	(3)	0.34789	0.22179	0.91891	0.87651	0.91011	0.97469
	(4)	0.97211	0.68943	0.12831	0.50006	0.20793	0.61151
	(5)	0.24954	0.17809	0.56093	0.51524	0.69135	0.68967
	(6)	0.10062	0.11852	0.47089	0.64765	0.44644	0.35548

Table CQS-A1 - Table of Random Fractions

ANNEXURE CQS-B – METHOD STATEMENT REQUIREMENTS

CQS-B1 GENERAL

Method Statements are required to describe the key steps and sequence in the construction activities, how and by whom each step shall be undertaken and what materials and equipment shall be used. Method Statements may include a flow chart to clarify the sequence of key steps. One or more Method Statements may address a Construction Activity.

Each Method Statement will be supported by a Checklist which shall identify relevant inspections, test points, materials requirements and Hold Points. Each requirement on the Checklist will have an officer responsible identified and will require the nominated officer to sign off the requirement so indicating its satisfactory execution.

Method Statements and Checklists shall be compatible with the appropriate Inspection and Test Plan. Checklists will be completed for each lot of work during construction and compiled with other documents to comprise the Quality Register.

The Constructor shall submit Method Statements and Checklists to describe the key steps in those Construction Activities listed below that are identified with a preceding asterisk (*).

Table CQS-B1 - Construction Activities

Item	Enter * if required	Activity	Specification Number
1		Control of Traffic	C201
2		Temporary Roadways and Detours	C201
3		Control of Erosion and Sedimentation	C211
4		Clearing and Grubbing	C212
5		Earthworks - Cut	C213
6		Earthworks - Unsuitable Material	C213
7		Earthworks - Embankment	C213
8		Compaction and Quality Control	C213
9		Siting, Excavation, Bedding, Backfilling and Compaction of Stormwater Drainage	C220
10		Installation of Pipe Drainage	C221
11		Installation of Precast Box Culverts	C222
12		Siting and Installation of Drainage Structures	C223
13		Construction of Lined Open Drains including Kerb and Gutter	C224
14		Stabilisation of Pavement or Subgrade Materials	C241
15		Provision of Subsurface Drainage as subsoil drains, pavement drains or free draining layer	C230-C233
16		Construction of Flexible Pavement Layers	C242
17		Sprayed Bituminous Surfacing	C244
18		Construction of Asphaltic Concrete Pavement Layers	C245
19		Sprayed Bituminous Surfacing (Polymer Modified)	C246
20		Pavement Marking	C261
21		Minor Concrete Works	C271
22		Landscaping	C273
23		Masonry Walls	C274
24		Service Conduits	C303
25		Trenchless Conduit Installation	C305
26		Water Reticulation	C401
27		Sewerage System	C402

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