0010 QUALITY REQUIREMENTS FOR DESIGN

1. General

1.1. Responsibilities

1.1.1. General

Requirement: Provide a quality management system (QMS) for the execution and recording of design processes.

All designs must conform to – current at the time of design:

- Narrabri Shire Council design specifications;
- Narrabri Shire Council LEP;
- Narrabri Shire Council DCP;
- Relevant Narrabri Shire Council Masterplans;
- Austroads;
- National Construction Code;
- Relevant State and Federal Legislation.

All designs must:

- Demonstrate the QMS by providing records of the design process;
- Provide documentation relevant to asset management;
- Include as part of the design documentation, all relevant designer names and titles;
- Include as part of design certification the names and relevant qualifications of the certifying officer;
- Include any authority requirements as highlighted in any DA consent conditions.

1.2. Design Conformance

All designs must conform with the requirements and reference documents specified by the relevant council worksection. The following documents are incorporated into this worksection by reference:

- Austroads – Guide to Road Design (all volumes);
- Transport for NSW supplements to Austroads;
- Transport for NSW supplements to Australian Standards;
- Transport for NSW Technical Directions;
- Transport for NSW Delineation Guidelines;
- Transport for NSW Road Signs Register;
- AS/NZS 2890 – Parking Facilities Parts 1-6;
- AS 1743 – 2018 – Road Signs – Specifications;
- National Construction Code (NCC) – 2019;

- Australian Rainfall and Runoff (Geoscience Australia, 2016 or Geoscience Australia, 2019);
- AS/NZS 3500.3 – 2021 – Plumbing and Drainage – Stormwater Drainage;
- AS/NZS 1170 (all volumes) – Structural Design Actions;
- AS 1684 (all volumes) – Residential Timber Framed Construction;
- AS 1742 (all volumes) – Manual of Uniform Traffic Control Devices;
- AS 3600 – 2018 – Concrete Structures;
- AS 4100 – 2020 – Steel Structures;
- AS 3700 – 2018 – Masonry Structures;
- AS 4678 – 2002 – Retaining Structures;
- AS 2159 – 2009 – Piling – Design and Installation;
- AS 2870 – 2011 – Residential Slabs and Footings;
- AS 5100 (all volumes) – Bridge Design;
- AS/NZS ISO-9000:2016 – Quality Management Systems – Fundamentals and Vocabulary;
- AS/NZS ISO-9001:2016 – Quality Management Systems – Requirements;
- WSA 02-2014 – Gravity Sewerage Code of Australia;
- WSA 03-2011 – Water Supply Code of Australia;
- WSA 07-2007 – Pressure Sewerage Code of Australia;
- AS 1940 – 2017 – The Storage and Handling of Flammable and Combustible Liquids;
- AS/NZS 4452 – 1997 – The Storage and Handling of Toxic Substances;
- AS 3780 – 2008 – The Storage and Handling of Corrosive Substances;
- AS 2507 – 1998 – The Storage and Handling of Agricultural and Veterinary Chemicals;
- AS 2865 – 2009 – Confined Spaces;
- Erosion and Sediment Control on Unsealed Roads: A Field Guide for Erosion and Sediment Control Maintenance Practices;
- A Resource Guide for Local Councils: Erosion and Sediment Control;
- Landcom: Managing Urban Stormwater – Soils and Construction (all volumes)

1.3. Standards

1.3.1. General

Standard: To AS/NZS ISO 9001 and as outlined in Section 1.2 – Design Conformance.

1.4. Interpretation

1.4.1. Abbreviations

General: For the purposes of this worksection the following abbreviations apply:

- NER: National Engineering Register by Engineers Australia;
- QMP: Quality Management Plan;
- QMS: Quality Management System;
- NCC: National Construction Code;
- RMS now Transport for New South Wales (TfNSW);
- NSC: Narrabri Shire Council;

- LEP: Local Environmental Plan;
- DCP: Development Control Plan;
- DA: Development Application
- WAE: Work as Executed

1.4.2. Definitions

General: For the purposes of this worksection the definitions given in AS/NZS ISO 9000 and the following apply:

- Accreditation: Certification by a statutory or approved authority of the facilities, capabilities, objectivity, competence and integrity of an organization or individual to provide a specified service and/or required operation;
- Certification: A written assertion of facts;
- Hold point: A mandatory verification position in the contract beyond which work cannot proceed without the designated authorisation;
- Witness point: A nominated position in the different stages of the Contract where the option of attendance may be exercised by the Superintendent, after notification of the requirement;
- Non-conformance: The non-fulfilment of documented requirements;
- Professional engineer: A person who is listed or is eligible for listing as a Professional Engineer on the National Engineering Register (NER) and has appropriate experience and competence in the relevant discipline at the relevant time;
- Quality design checklists: Forms completed during the design process verifying key steps and records;
- Records: Documents and data, no longer subject to alteration, that provide evidence of activities performed;
- Validation: Confirmation, through the provision of objective evidence, that requirements for a specific intended use or application have been fulfilled;
- Verification: Provision of evidence or proof that a performance requirement has been met or a default exists.

2. Quality Management System for Design

2.1. General Requirements

2.1.1 Design Organisations Quality Management System requirements

Requirements: Provide a Quality Management Plan conforming to this worksection and AS/NZS ISO 9001 and to include the following:

- Quality manual including the organisation's Quality Policy;
- Responsibilities for the implementation of the Quality Policy for the project;
- A commitment from top management to the development and implementation of the QMS;
- Evidence of the resources, infrastructure and work environment for the project;
- Policy for evaluating and selecting Subconsultants.

2.2. Design Planning

2.2.1. General

Collaboration: Coordinate the different groups involved in the development of the design to ensure effective communication and clear assignment of responsibility.

Integrated planning with Subconsultants: verify and incorporate inputs into the design process.

2.2.2. Design quality plan

Requirement: Provide a Design Quality Plan, to Include the following:

- Design stages;
- Review and verification for each stage and validation of the completed design;
- Responsibilities and authorities for design;
- Design team, including Subconsultants, names of team members, roles and technical interfaces;
- Resources assigned to the project;
- Organisation chart including communication paths with the Superintendent, the Principal, other Consultants and Contractors;
- Specify the contractor's requirement for review and site inspections during the construction phase;
- Design inputs such as requirements and acceptable criteria;
- Any witness points or hold points for the design stages;
- Programmed approvals/consultations with regulatory authorities;
- Third party review/verification/validation required by the Principal or regulating authority;
- Proposed design documentation;
- Procedure for managing design changes of project audits;
- Records of design processes and review, verification and validation.

2.3. Design Input and Output

2.3.1. Design Input

Input to AS/NZS ISO 9001 clause 8.3.3: All designs shall identify, document and review for adequacy the following:

- Principal's brief;
- Site information, including survey information, geotechnical reports, environmental reports, hydrology plans and Local Environmental Plans;
- Codes of practice, Development Control Plans (DCP's) and Council's engineering requirements;
- Regulatory and statutory requirements;
- Performance criteria;

- Design criteria;
- Materials;
- Requirement: Give notice if the design inputs do not provide sufficient information for verification;
- Review: Submit design proposals for approval by the principal at appropriate stages.

2.3.2. Design Output

Output to AS/NZS ISO9001 clause 8.3.5: To include the following produced at various stages:

- Advice;
- Calculations;
- Drawings;
- Models;
- Other contract documents;
- Reports;
- Schedules of quantities;
- Sketches;
- Specifications.

Design checklist: Provide a quality record of the design processes and integrate additional criteria, as required, in the design checklists in Annexure A.

Acceptance criteria: Define on drawings or in the specification the acceptance criteria for standards of workmanship and other design requirements.

Define: Key characteristics e.g. safety signs.

2.4. Review, Verification and Validation

2.4.1. Design review

Design meetings: Minute design meetings with all relevant parties in attendance and make sure the following considerations are included in the agenda:

- Principal's requirements;
- Sequence of design activities;
- Conformance with the design brief;
- Identification and control of design interfaces;
- Construction processes;
- Safety methods;
- Methods of verification;
- Consultation including Council or other authority approvals, public input and existing utilities;
- Completion of road safety audit.

Records: Provide and maintain quality records by notation on documents, minutes and checklists signed off by the review leader.

2.4.2. Design Verification

Verification: At completion of each design stage certify the result of a given activity for conformance with the design input requirements for that activity. Include the following:

- Document the process;
- Identify responsibilities;
- Maintain records of the verification.

2.4.3. Design Validation

Validation: At completion of design, certify the design for conformance with the design requirements. Include the following:

- Document the process;
- Identify responsibilities;
- Maintain records of the verification.

2.4.4. Certification

Requirement: Submit a Certification Report signed by the designer and appropriately qualified professional engineer (refer Section 1.4 for definition), accompanied by drawings and specification, conforming to the design certificate and checklists included in **Annexure A** at the following stages:

- Each preliminary design stage;
- Completed design.

Exemption: A Certification Report is not required when submitting sketch or concept designs.

2.4.5. Design Audit by Council

Requirement: Provide all reasonable assistance for the inspection of records of designs submitted to Council.

Notice time: Provide all reasonable assistance for the inspection of records of designs submitted to Council for acceptance. Provide access to the designer's premises on a 24hr notice basis.

2.5. Control of Design Changes

2.5.1. Design changes

Requirement: Review and amend the design quality plan as necessary during the course of the design, include the following:

- Manage, identify and record any design changes;
- Identify who can make and approve changes;
- Procedure for review of wider implications of design changes.

Process for changing documents after issue for construction: Once documents are issued for construction, any changes must go through the review, verification and approval process prior to re-release for construction.

Principal approval required for design changes to documents after issued for construction.

Record: Maintain a register of design changes.

2.6. Control of Documentation

2.6.1. Documentation

Distribution control: Maintain a master list of controlled documents. Include the following information:

- The source of data used in calculations and on drawings;
- Record of the personnel authorised to review, approve and change documents.

Design documentation and data: Provide calculations, sketches, drawings (including those retained for reference or circulated outside the design team), data sheets and specifications.

Requirement: Control and retain documents and data relating to the project e.g. from the Principal, other Consultants or Subconsultants and suppliers.

Design change register: Record changes to any documents after they have been issued for construction.

2.6.2. Certification

Certification Report: Submit for approval a Certification Report signed by the designer and certifying engineer and accompanied by drawings and specifications. Conform with the design certificate and checklists included in **Annexure A**.

Certification of preliminary drawings: Submit a Certification Report with all preliminary drawings. Submit an updated Certification Report with the submission of final drawings. A Certification Report is not required when submitting sketch plans or concept plans.

2.6.3. Drawing requirements

Drawings: Define and set out the design concepts on design drawings in conformance with the following:

- Prepare all design drawings on a Council approved standard sheet with each sheet clearly numbered as part of a set. **Annexure A** provides guidelines for grouping information in design drawings;
- Refer to design worksections for documentation requirements;
- Provide a space in the bottom right hand corner of each drawing for an assigned number provided by Council, include the title on each page, drawing number, revision and date;
- Do not overcrowd the drawings with information;
- If colour is used to distinguish information, ensure submitted copies are in colour;
- Use A1, A2 and/or A3 size sheets, suitable for black and white copying and reduction to A4 paper size without loss of clarity;
- DWG copy of the design to be submitted as part of WAE.

2.7. Control of Records

2.7.1. Records

Requirement: Retain appropriate design records in a format which can be understood readily without prior knowledge of the particular design and readily accessible.

Copies of records: Make copies of records available to Council upon request without charge.

Design file: Maintain a file containing records of calculations, approvals and decisions, geotechnical data and other design data that could be relevant in reviewing aspects of the design or planning future maintenance responsibilities.

Calculation record retention: Keep all calculations for the duration of the construction maintenance period.

Maintain Hydrologic and hydraulic design records.

2.8. Control of Non-Conformance

2.8.1. Design Variations

Record: Identify on the Certification Report checklists any aspects of the design which do not meet the requirements or tolerances set out in this worksection and other applicable Council design and construction specifications.

3. Annexure

Annexure A – Design Checklists

ECM Number	Document
1979257	Design Checklists