DEVELOPMENT DESIGN SPECIFICATION

DQS

QUALITY ASSURANCE REQUIREMENTS FOR DESIGN

Amendment Record for Development and Design Manual

This Specification has been compiled by Local Councils in the Northern Rivers area (See previous listing for participating Councils). It is derived from the AUS-SPEC generic Development Specification Series - Design manual and includes amendments required by these Councils.

Details are provided below outlining the clauses amended from the Council edition of this AUS-SPEC Specification Part. The clause numbering and context of each clause are preserved. New clauses are added towards the rear of the specification part as special requirements clauses.

The amendment code indicated below is 'A' for additional script 'M' for modification to script and 'O' for omission of script. An additional code 'P' is included when the amendment is project specific.

Amendment Sequence No.	Key Topic addressed in amendment	Clause No.	Amendment Code	Author Initials	Amendment Date
Original	*Northern Rivers - Local Government version*	*Document*	*Original edition*		*August 1998*
1	Major Revision as per Aus-Spec Bulletin Board Release 10	All	AMO	SPM	April 2003
2	Revisions as per Aus-Spec Bulletin Board releases 11 & 12	All	AMO	SPM	April 2003
3	Additional clause requiring PI Insurance to $5 million	DQS.06	A	SPM	December 2007
4	Plans to be signed and dated	DGS04	A	SPM	July 2010
5	Submission of Design Documentation & Drawings	Annexure DQS-B	AM	JS/ID	February 2020

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ANNEXURES

QUALITY ASSURANCE REQUIREMENTS FOR ENGINEERING DESIGN

DQS.01 SCOPE

Quality Assurance

1. This design specification sets out the process for quality assurance of Designs required by Council for development consents. The requirements are applicable to all design work whether undertaken by the Developer, his Project Manager, Consultant or a sub-consultant.

Prerequisite

2. The specification refers to Engineering Design processes. Requirements which refer to the Concept Design of developments are generally covered in Council's Subdivision Code. The requirements of the Subdivision Code are a prerequisite to the quality requirements for Engineering Design provided in this specification (DQS).

3. The specification refers also to engineering design processes for developments that do not involve subdivision.

DQS.02 OBJECTIVES

Maintenance

1. This specification aims to set standards and document requirements for the execution and recording of design processes in order that the infrastructure associated with any development is designed to be fit for service and of a standard reasonably maintainable when it is accepted by Council as a community asset.

Records

2. It is also an objective that these qualities be readily demonstrable by clear records of key design processes and that data relevant to the upkeep of the assets is available to Council's management.

DQS.03 REFERENCE AND SOURCE DOCUMENTS

(a) Council Specifications

All Specifications for Design and Construction
Council's Codes and Policies

It is recommended that consultants and developers consult with council for current versions of these documents

(b) Australian Standards

AS/NZS 3905	Guide to quality system Standards AS/NZS 9001, AS/NZS 9002 and AS/NZS 9003..
AS/NZS ISO 9000	Quality management and quality assurance Standards – Generic guidelines for the application of ISO 9001 ISO 9002 and ISO 9003
AS/NZS ISO 9001	Quality management systems

(c) Other

Section 90 (EP&A ACT)
Local Government Act (1919) Subdivisions Pt XII
Local Government Act (1993)
Technical Publications used as Engineering Standards (AR&R)
Interim Policies and Guidelines

DQS.04 CERTIFICATION

1. The Developer shall present all engineering drawings to Council for acceptance. Each set of drawings shall be accompanied by a Certification Report which will be signed by the Developer's Engineer or Quantity Surveyor. The Certification Report will comprise the certificate and check lists set out in Annexure DQS-A.

Certification Report

2. Certification Reports shall be required with preliminary drawings and shall require resubmission with updates when final drawings are submitted. Certification is not required with sketch plans or concept drawings.

Certification of Preliminary Drawings

3. The Certification Report shall indicate on check lists any aspects of design which do not meet requirements or tolerances set out in Council's Design and Construction Specifications and Subdivision Codes.

4. All final design plans shall be dated and signed by the appropriately qualified Designer.

Plans signed and dated

DQS.05 MINIMUM DRAFTING REQUIREMENTS

1. Design drawings shall be definitive and clearly set out so as to present the design concepts in such a way that the project can be understood, specified for construction and satisfactorily built.

2. All design drawings should be clearly numbered by the designer with separate sheets numbered as part of a set. All drawing sheets shall have an allocated space in the bottom right hand corner for an assigned number provided by Council (18 characters).

Drawing Numbers

3. The information shown on the drawings shall be logically collected on discrete sheets to avoid illogical and onerous effort in cross referencing between sheets in order to find information. Sheets of drawings should not be overcrowded with information and should not rely on colour printing or colour wash to impart information. Drawings should be on A1 or A2 size sheets and be suitable for black and white copying and photo reduction to A3 paper size without loss of clarity.

Logical Drawing Sheets

4. Annexure DQS-B provides guidelines for grouping information in design drawings.

DQS.06 DESIGNER'S QUALIFICATIONS

1. A Civil Engineer deemed to be suitably experienced by Council and qualified so as to be accepted as a member of the Institution of Engineers, Australia or a Registered Surveyor deemed to be suitably experienced by Council shall be accepted as qualified to submit drawings for roadworks, drainage works, water supply, sewerage works (excluding pumping stations), canal works (excluding flood control structures and bridges).

Engineer Surveyor

2. A Civil Engineer qualified as detailed above shall be accepted as qualified to submit plans for bridges, retaining walls, miscellaneous structures, buildings, pumping stations and flood control structures.

Structural Design by Engineer

2. A Civil Engineer or registered surveyor who undertakes works detailed in DQS.06 shall be required to hold a minimum of $5 million professional indemnity insurance, including insurance runout provisions, in all design works to be submitted to Council and/or PCA. Reference to PI insurance should also be made in clause EA of the guidelines in this document.

PI Insurance

DQS.07 RECORDS

1. The Designer shall retain appropriate design records in a format such that they can be understood readily by design staff with no prior knowledge of the particular design.

2. Calculations which can readily be re-done need not be kept once the construction maintenance period of the project has expired.

Calculation Record Retention

3. A design file shall be maintained by the Subdivider or his consultant containing records of calculations, approvals and decisions, geotechnical data and other design data which could be relevant in reviewing aspects of the design or planning future maintenance responsibilities.

Design File to be kept

4. Particular requirements apply to hydrological and hydraulic design data. (Refer to Council's Stormwater Drainage Design Specification).

Hydrologic Design

5. Copies of records will be made available to Council on request and without charge.

Hydraulic Design

DQS.08 AUDIT

1. Council shall have the right of audit of all processes and documents related to the project design. The Developer and the Developer's Consultant shall provide Council's Officers all reasonable assistance in inspecting records of designs submitted to Council for acceptance.

Assistance

2. In order to provide for such audit, access to the premises of the Developer or the Developer's Consultant will be provided to Council on a 24 hour notice basis.

Access

ANNEXURE DQS-A

COUNCIL
DESIGN CERTIFICATION REPORT

Project Title: _____

DA/BA No: _____

Consultant's Drawing No: _____

Name of Consultant: _____

Name and Address of Developer: _____

_____

I certify that the subject drawings represent a design for which the attached design check lists provide a valid record.

I certify that this design has been carried out in accordance with current standards of good industry practice and in accordance with Council's Design Specifications, Subdivision Code and specific instructions received with the exception of departures cited in the attached design check lists for Council's advice.

I certify that this Design will not significantly impact on the environmental factors of the area as interpreted under Part V of the Environmental Planning and Assessment Act.

I certify that this Design is in strict compliance with the development consent conditions and where a variance to the consent is found, written confirmation has been received from Council approving of the variance prior to the lodgement of Design Plans (this includes designs for staged construction).

I certify that all structural elements of the Design have been designed by a competent qualified practicing Civil or Structural Engineer.

Contact Phone: _____

_____
Design Engineer/Surveyor Date

Contact Postal Address: _____

_____
Qualifications

_____

_____

_____

Design Check List 1 BASE PLOT OF EXISTING FEATURES

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
1.1	Initial Plot verified by site inspection for existing drainage.	_____	/ /	☐
1.2	Initial Plot verified by site inspection for existing property descriptions, boundaries and accesses.	_____	/ /	☐
1.3	Initial Plot of contours verified as representative of site terrain.	_____	/ /	☐
1.4	Trees and significant environmental features affected by development are clearly indicated and annotated.	_____	/ /	☐
1.5	Features significant to heritage considerations within the development boundaries are clearly indicated and annotated.	_____	/ /	☐
1.6	Existing public and private property likely to be affected by these Designs are clearly indicated and annotated.	_____	/ /	☐
1.7	Survey and benchmarks clearly indicated and annotated.	_____	/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 2 HORIZONTAL ROAD ALIGNMENT

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
2.1	Alignment compatible with design speed.		/ /	☐
2.2	Alignment is adequate in relation to clearance of roadside hazards.		/ /	☐
2.3	Driver and Pedestrian sight distance is adequate.		/ /	☐
2.4	Conflict with existing services is minimised.		/ /	☐
2.5	Road widths and lanes meet Councils requirements and design traffic requirements.		/ /	☐
2.6	Alignment of bridges suits road alignment.		/ /	☐
2.7	Pedestrian, bicycle and parking requirements are met.		/ /	☐
2.8	Provision for large vehicles such as buses, garbage trucks and emergency vehicles is adequate.		/ /	☐
2.9	Intersection Layouts meet turning requirements of design traffic including emergency vehicles.		/ /	☐
2.10	Pavement width tapers and merges are adequate.		/ /	☐
2.11	Pedestrians and prams are catered for.		/ /	☐
2.12	Conflict with existing Public Utility services has been identified and resolved.		/ /	☐
2.13	Horizontal road alignment has been provided in accordance with any Conditions of Development Consent.		/ /	☐
2.14	Horizontal road alignment setout data is clearly defined and tabulated.		/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 3 VERTICAL ROAD ALIGNMENT

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
3.1	Grades meet maximum and minimum requirements.		/ /	☐
3.2	Vertical clearances to bridges and services meet standards.		/ /	☐
3.3	Vertical sight distance is adequate for drivers and pedestrians.		/ /	☐
3.4	Cover to drainage structures or services is adequate.		/ /	☐
3.5	Vertical alignment is adequate for disposal of surface drainage from properties and from road.		/ /	☐
3.6	Grades less than 12 percent or alternate scour treatments provided.		/ /	☐
3.7	Vertical alignment is compatible with property access.		/ /	☐
3.8	The gradient on an intersecting road is not significantly greater than the cross slope of the through pavement and no greater than 4% at give way and stop signs.		/ /	☐
3.9	Sight distance is acceptable for all accesses to roundabouts.		/ /	☐
3.10	Alignment coordination with horizontal alignment is in accordance with the design guides as referenced in the AUS-SPEC specifications.		/ /	☐
3.11	Conflict with existing Public Utility services has been identified and resolved.		/ /	☐
3.12	Vertical road alignment setout data is clearly defined on the longitudinal sections.		/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 4 ROAD CROSS SECTIONS

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
4.1	Typical Cross Sections have complete dimensions.		/ /	☐
4.2	Typical Cross Sections have kerb & gutter, road safety barrier and surface drainage indicated.		/ /	☐
4.3	Batter slopes are indicated and batter treatment is indicated where appropriate.		/ /	☐
4.4	Property boundaries, service allocations and location of known existing underground services and pathway treatments are indicated.		/ /	☐
4.5	Sufficient Cross Sections are shown to define all variations and width transitions.		/ /	☐
4.6	Cross sections are of sufficient width to fully assess impact of road level on adjoining property		/ /	☐
4.7	Stability of embankment slopes, batters and retaining walls has been verified as satisfactory.		/ /	☐
4.8	Cross section reference level conforms with vertical road alignment.		/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 5 ROAD AND INTERALLOTMENT DRAINAGE

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
5.1	Drawings indicate existing catchment boundaries and surface drainage.		/ /	☐
5.2	Hydrological data is the most current available.		/ /	☐
5.3	Hydrologic and Hydraulic design calculations are complete and fully recorded and included for audit.		/ /	☐
5.4	Underground drainage and structures do not conflict with services.		/ /	☐
5.5	The designed drainage lines are compatible with existing incoming lines and outgoing lines both geometrically and hydraulically.		/ /	☐
5.6	The length of line, type of pipe, size, class and bedding requirements are indicated for each drainage line on the schedule of drainage elements.		/ /	☐
5.7	Height of fill over drainage lines is within allowable limits.		/ /	☐
5.8	Drainage is provided for local depressions eg median areas or areas adjacent to fills.		/ /	☐
5.9	The effect of headwater and back-up water on private property has been assessed.		/ /	☐
5.10	Subsurface drainage has been provided when required and clearly located by line and level, with details provided.		/ /	☐
5.11	The need for batter drains has been considered for fills and cuttings.		/ /	☐
5.12	The height and energy level of downstream drainage has been considered.		/ /	☐
5.13	Drainage structures and flowpaths are located so as to ensure safe vehicular and pedestrian transit.		/ /	☐
5.14	Drainage structure number, setout, type and pipe details indicated on the drainage plans and schedule of drainage elements.		/ /	☐

	Check Completed By *(initials)*	Date	Not Applicable *(tick)*

5.15	Emergency flowpaths are located so as to minimise impact on private property.	_____	/ /	☐
5.16	Road drainage has been provided in accordance with any Conditions of Development Consent.	_____	/ /	☐
5.17	Interallotment drains have been designed in accordance with Council's Specification and/or Australian Rainfall and Runoff (Edition 1987).	_____	/ /	☐
5.18	Appropriate land stabilisation and velocity controls have been implemented to pipe systems, open channels and embankments.	_____	/ /	☐
5.19	For allotments affected by flood controls, the floor height controls are to be compatible with road and drainage levels.	_____	/ /	☐
5.20	Legal discharge points exist for all drainage catered for by this design.	_____	/ /	☐
5.21	The chosen water quality management devices have minimum impact on Council's maintenance program.	_____	/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 6 SIGNS AND MARKINGS

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
6.1	Sign types, sizes, locations and support structure details are shown on the drawings in accordance with AS1742 (All parts).		/ /	☐
6.2	Pavement linemarking and pavement marking "type and setout" is indicated on the drawings to meet the requirements of AS 1742.2.		/ /	☐
6.3	Signs and linemarking have been designed in accordance with any special Conditions of Development Consent.		/ /	☐
6.4	Suitable roadside furniture has been included. (ie: guideposts, guardrails, etc.)		/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 7 PAVEMENT DESIGN

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
7.1	The pavement design "and surface treatment" is shown clearly on the drawings and any variations are indicated on appropriate cross sections.	_____	/ /	☐
7.2	The pavement design complies with the Pavement Design Specification. (Refer to section D2)	_____	/ /	☐
7.3	Pavement Design is in accordance with any Conditions of Development Consent.	_____	/ /	☐
7.4	Geotechnical data is assessed as adequate and is held on the design file.	_____	/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 8 BRIDGE/MAJOR CULVERT DESIGN

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
8.1	The design has been performed by a competent practicing Civil or Structural Engineer.		/ /	☐
8.2	Geotechnical data is assessed as adequate and is held on the design file.		/ /	☐
8.3	The type and functional dimensions of the bridges meet AUSTROADS Bridge Design Codes 1992, AS 3600 (1988), AS 1684 (1992), AS 1170 (1989), AS 4100 (1990).		/ /	☐
8.4	The type and class of all materials are indicated on the drawings.		/ /	☐
8.5	Records of all significant design calculations are available for audit.		/ /	☐
8.6	The design complies with any Conditions of Development Consent.		/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

Design Check List 9 EROSION AND SEDIMENTATION CONTROL PLANS

		Check Completed By *(initials)*	Date	Not Applicable *(tick)*
9.1	Both short term and long term erosion control plans have been prepared using the guidelines within Council's Design Specification D7 and Construction Specification C211.	_____	/ /	☐
9.2	Erosion and Sedimentation Control has been designed in accordance with any Conditions of Development Consent.	_____	/ /	☐

DEPARTURES FROM COUNCIL OR STATE ROAD AUTHORITY NORMAL REQUIREMENTS OR SPECIAL FEATURES TO BE NOTED:

ANNEXURE DQS-B

SUBMISSION OF DESIGN DOCUMENTATION & DRAWINGS

A. PLANS

Refer Guidelines For Development and Subdivision of Land – Section E1 and Geometric Road Design (Urban & Rural) – Section D1.06.

Design drawings shall include (but not be limited to) :

- Earthworks,
- Roadworks,
- Stormwater drainage (including inter-allotment drainage),
- Water reticulation,
- Sewerage reticulation,
- Structures
- Sediment and Erosion Control and,
- Other works associated with the development project

Separate layout plans may be required as part of a submission (combined services plans require agreement of Council).

Services not being detailed may be shown on plans as background information but clarity must be considered.

Generally, Drawings will show detail of the following (subject to development type, complexity and Council direction :

a) General

- Approval reference (development consent, construction certificate, Local Government Act, Water Management Act or Roads Act as applicable)
- Existing contour plan
- Extent of work and staging plan
- Locality Plan,
- North Point
- Scales

b) Earthworks, Roadworks and Stormwater Drainage
(Refer Handbook of Stormwater Drainage Design – Appendix C)

- Earthworks Plan
- Roadworks and Drainage Plan
- Road Longitudinal Sections
- Road Cross-Sections (minimum spacing 20m or as agreed)
- Typical Road Cross Sections showing formation width, seal width, pavement (design) configuration, batter slopes, kerb and gutter types
- Bridges and Culvert Structures (where applicable)
- Intersection Details (set-out, finished contours, kerb grading)
- Drainage Longitudinal Section and HGL

- Hydraulic calculations and Catchment Plan
- Inter-allotment Drainage Details (including easements)
- Landscape Plan (as required)
- Structure types and details
- Preliminary pavement design (subject to testing)

c) Sediment and Erosion Control Plans (Refer Landcom 'Blue Book' and Council DCP)

- Layout Plan
- Maintenance schedule

d) Water Reticulation

- Water Reticulation Plan
- Pipe details (size, type, class)
- Water main alignments
- Fittings locations (valves, hydrants etc)
- Longitudinal sections for 300mm diameter mains and above
- Pump station details
- Reservoir details
- Live connection requirements and associated details
- Conduits and property services
- Easement locations and details
- Service clash details (clearance, protection works etc)

e) Sewerage Reticulation

- Sewer Reticulation Plan
- Pipe details (size, type, class)
- Sewer main alignments
- Manhole locations,
- House connection junction type and level
- Longitudinal sections of each line including structure type, drop and lid type
- Sewer pump station details
- Live connection requirements and associated details
- Equivalent populations, flow and design capacity
- Easement location and details

f) Road Bridge and Major Culvert Structures

- Borehole locations and logs with design parameters;
- Design flood events (AEP or ARI)
- Outlet velocity
- Design levels
- Existing ground / flowpath profile
- Excavation
- Scour protection (inlet / outlet, pier, abutment etc)
- Design loading (traffic, bearing, dead load etc)
- Hydraulic grading details and pipe capacities
- Exposure classification
- Replacement / repair procedures (as required)

g) Electrical Reticulation and Street Lighting

- Street lighting and electrical reticulation plan
- Street lighting category
- Light pole / column details
- Lantern types
- Street lighting positioning zones compliance (AS/NZ 1158)
- Demonstrate that services (including pillars) do not conflict with other services / infrastructure and considers the roadway clear zone
- Service / conduit clash details

h) Construction & Traffic Management Plans / Documentation

- Traffic management plans to be in accordance with the current version of the RMS 'Traffic Control at Worksites' manual
- Construction management plans to be in accordance with the requirements of Workplace Health and Safety legislation, traffic management principles and engineering construction 'best practice' methods