Engineering Design Specification

D02 Quality Requirements for Design

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This document is a modified version of AUS-SPEC 0010 Quality Requirements for Design

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Wingecarribee SHIRE COUNCIL

Table of Contents

1 General

1.1 Introduction

Objective

1.1.1 Worksection application

Description: This worksection is applicable to providing a quality management system to AS/NZS ISO 9001 for engineering design processes required by Council for engineering works. The requirements are applicable to all design work whether undertaken by designers within Council, a Consultant or a Subconsultant.

1.2 Responsibilities

1.2.1 General

Requirement: Provide a quality management system (QMS) for design as documented.

- Wingecarribee Council Local Environmental Plan (LEP) - 2010
- Wingecarribee Council Development Control Plans (DCP's) - for specific towns & villages
- Wingecarribee Council Standard Drawings
- Wingecarribee Community Engagement Policy
- Demonstrate the QMS by providing records of the design process.
- Provide documentation relevant to asset management.

1.2.2 Design Certification qualifications

Designer is a Professional Engineer who shall be accepted as qualified to certify designs & drawings including roadworks, drainage works, bridgeworks, water supply reticulation, sewerage reticulation works, retaining walls, miscellaneous structures, buildings, pumping stations for sewer and water and flood control structures commensurate with that person's training and experience.

Authority requirements: The following consent authorities may have input into the development

- Sydney Catchment Authority
- Rural Fire Service
- NSW land registry services
- Transport for NSW (formerly Roads and Maritime Services)
- Rail Corporation
- NSW office of Environment and Heritage
- Department of Planning and Environment
- Department of industry - Office of Water
- Hawksbury-Nepean Catchment Authority
- NSW Aboriginal Land Council

1.3 Standards

1.3.1 General

Standard: To AS/NZS ISO 9001. Note: Compliance with the principles of ISO 9001 is required however formal accreditation requirements is at Council's discretion.

Conform to Wingecarribee Shire Council Standard Drawings, as applicable. Refer to Council's Website for the latest version of Council's standard drawings.
Conform to Landcom "Blue Book". Landcom Publication; *Managing Urban Stormwater: Soils and Construction Vol 1, Landcom 2004-Latest Edition,*

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.

QMS: Quality management system.

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 organisation or individual to provide a specified service and/or required operation.
- Certification: Assertion, in writing, of facts.
- Hold point: A defined position in the different stages of the Contract beyond which work cannot proceed without mandatory verification and acceptance by the Superintendent.
- Non-conformance: Non fulfilment of a requirement, need or expectation that is stated, generally implied or obligatory.
- Professional Engineer: Meets the criteria for registration on the National Engineering Register (NER) and has appropriate experience and competence in the relevant registered area of practice.
- Quality design check lists: Forms completed during the design process verifying key steps, and records.
- Records: Documents and data which are no longer subject to alteration and provide evidence of activities performed.
- Registered Surveyor: A member of the Institution of Surveyors. The registered surveyor would need to attain acceptable accreditation for civil design in the relevant area of practice.
- 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 System requirements

QMS: Plan, develop and maintain a documented QMS conforming to this worksection and AS/NZS ISO 9001.
Format: If the format of the QMS documents differ from the format of AS/NZS ISO 9001, provide a matrix outlining how the documented requirements are addressed by the QMS.
Collaboration: Coordinate the different groups involved in the development of the design to provide effective communication and clear assignment of responsibility.

2.2 Documentation requirements

2.2.1 General

QMS documentation requirements: Include the following:

- Quality policy and objectives.
- Quality plan(s).
- Procedure documents.
- Forms.
- Relevant external documents.
- Records.

Changes: Immediately implement changes to the project QMS and design Quality plan if the following occurs:

- Specification requirements are not adequately addressed.
- Non-conformity resulting from the QMS or Quality plan.
- Audit initiates changes to the QMS.
- Procedures have changed.

Records: Provide copies of any quality records within 14 days of request.

2.2.2 Design quality plan

Requirement: Provide a design Quality Plan, Include the following:

- Design program including stages.
- Review and verification for each stage and validation of the completed design.
- Responsibilities and authorities for design.
- Organisation chart including communication paths with the Superintendent, the Principal, other Consultants and Contractors.
- Design inputs such as requirements and acceptable criteria.
- 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.

2.2.3 Design input

Requirement: Identify, document and review for adequacy the following:
Principal's brief: Confirm scope and program to complete each stage

Site information: Confirm site identification, survey data, geotechnical data and hydrology

Codes of practice:

- Safe Work Australia - Code of Practice, Safe Design Of Structures
- List other codes of practice agreed with the Principal and currently employed

Regulatory and statutory requirements:

- Include any site specific conditions imposed by utilities and regulatory authorities. Include Environmental Impact Statement (EIS) if applicable.

Performance criteria:

- Principal interaction at documented check points as part of the final documentation.

Design criteria:

- Specify the design criteria within the technical design worksections if applicable.

Materials:

- Specify any proprietary or specific materials or benchmarks within the technical design worksections.

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 Review, verification and validation

2.3.1 Design review

Requirement: Conduct regular reviews to evaluate the design and identify problems and propose corrective action. Include the following:

- 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 authority approvals, public input and existing utilities.

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

2.3.2 Design verification

Verification: At the end of each design stage examine the result of a given activity for conformance with the specified input requirements for that activity, include the following:

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

Independent design verification: May or may not be required, depending on the type and size of the project.

2.3.3 Design validation

Validation: Following completion of design, validation shall be performed to make sure the design has met the specified requirements, including the following:

- Document the process
- Identify responsibilities
- Maintain adequate records of the validation

Outcome: There are some characteristics which cannot be validated e.g. corrosion resistance, wind load resistance, resistance to climatic extremes, earthquake resistance etc.

2.3.4 Certification

Requirement: Submit a Certification Report signed by the designer accompanied by drawings and specification, conforming to the design certificate and checklists included in **Annexure A** at the completed design stage.
Exemption: A Certification Report is not required when submitting sketch or concept designs.

2.3.5 Design audit by Council

Requirement: Provide all reasonable assistance for the inspection of records of designs submitted to Council.
Notice time: Minimum 24 hours for access to the requested documentation.

2.4 Control of non-conformance

2.4.1 General

Detection and reporting: Identify, control and report non-conformance with the design requirements.
Design variations: Record on the Certification Report checklists any aspects of the design that do not meet the design input requirements or tolerances and other applicable Council design and construction specifications.

2.5 Control of design changes

2.5.1 Design changes

Requirement: Identify, review and control changes to the design. Include the following:

- Control of requests for changes.
- Review of impact of changes.
- Authorisation of changes.

Process for changing design after issue of documents for construction: Review, verify and approve before re-release for construction.
Record: Maintain a register of design changes.
Principal approval required for design changes to documents after issued for construction: Wingecarribee Shire Council to approve any changes to design, prior to construction.

2.6 Control of documentation

2.6.1 Documentation

Requirement: Control and retain documents and data relating to the project, including from the Principal, other consultants or subconsultants and suppliers.
Design documentation and data: Provide calculations, sketches, drawings (including those retained for reference or circulated outside the design team), data sheets and specifications.
Design change register: Record changes to documents after issue for construction.

2.7 Control of records

2.7.1 Records

Requirement: Retain design records in a format readily accessible without prior knowledge of the particular design.
Copies of records: If a consultant or subconsultant is engaged in preparing the design, the copies of records will be available to Council upon request.

Design file: Maintain a file containing records of calculations, approvals and decisions, geotechnical data and other design data that may 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.

3 Annexure A

3.1 Certification report

3.1.1 Design Certificate

Project Title: _____

Council Reference No: _____

Documentation including Consultant Drawing No/s: _____

I certify that the documentation noted above represents a design in conformance with the Wingecarribee Shire Council Engineering Design Specifications and Drawings, Australian Standards and relevant guidelines as referenced in the Engineering Design Specifications for which the following checklist/s provides a valid record:
Design checklist: (*Insert checklist name, e.g. "Documentation of existing site features")*

I certify that this design conforms to current Australian or International standards, industry guidelines, codes of practices, the Wingecarribee Shire Council Engineering Design Specifications and Drawings; and specific instructions received with the exception of departures cited in the attached design checklists.

I certify that this design will not significantly impact on the environmental factors of the area as interpreted under the following:
Legislation: (*Insert the appropriate legislation for NSW & Federal environmental regulations, e.g. "Environmental Planning and Assessment Act*")

I certify that all structural/civil/hydraulic elements have been designed by a Professional Engineer, or under the supervision of a Professional Engineer, suitably experienced and competent in the relevant field.

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 the variance prior to the lodgement of Design Plans (this includes designs for staged constructions)

I certify am the holder of a current Professional Indemnity Insurance Policy

Date:	
Contact phone:	
Contact postal address:	
Consultant Company name:	

Design Engineer:	
Qualifications:	
ABN:	
Signature:	

3.2 Design Checklist 1 - Documentation of existing site features

3.2.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
1.1	Check detail survey by site inspection for existing drainage.	……	...../...../.....	☐
1.2	Check detail survey by site inspection for existing property descriptions, boundaries and accesses.	……	...../...../.....	☐
1.3	Check detail survey of contours as representative of site terrain.	……	...../...../.....	☐
1.4	Document trees and significant environmental features affected by the works.	……	...../...../.....	☐
1.5	Document significant features to heritage within the Works boundaries.	……	...../...../.....	☐
1.6	Document existing public and private property likely to be affected by the design.	……	...../...../.....	☐
1.7	Document survey (of contours and features) and benchmarks of the site and up to 3 metres within neighbouring lot's.	……	...../...../.....	☐

3.2.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.2.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.3 Design Checklist 2 - Horizontal road alignment

3.3.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
2.1	Check that alignment is compatible with design speeds.	…….	...../...../.....	☐
2.2	Check that alignment is adequate in relation to clearance of roadside hazards.	…….	...../...../.....	☐
2.3	Check that there is adequate horizontal sight distance for drivers and pedestrians.	…….	...../...../.....	☐
2.4	Check that there is approved conflict with existing services by reference to dial before you dig.	…….	...../...../.....	☐
2.5	Check that road widths and lanes conform to Council's traffic design requirements.	…….	...../...../.....	☐
2.6	Check that bridge alignment is	…….	...../...../.....	☐

		By	Date	NA
	compatible with the road alignment.			
2.7	Check for adequate pedestrian, pram, bicycle and parking provisions.	…….	...../...../.....	☐
2.8	Check for adequate provision for large vehicles such as buses, garbage trucks and emergency vehicles.	…….	...../...../.....	☐
2.9	Check that intersections conform to the turning requirements of design traffic, including emergency vehicles.	…….	...../...../.....	☐
2.10	Check adequate pavement width tapers and merges.	…….	...../...../.....	☐
2.11	Identify and resolve any levels of conflict with existing utility services.	…….	...../...../.....	☐
2.12	Document horizontal road alignment set out data.	…….	...../...../.....	☐
2.13	Check provision of superelevation and superelevation development lengths.	…….	...../...../.....	☐
2.14	Check adequate sight distance for corners.	…….	...../...../.....	☐
2.15	Check adequate Overtaking sight distance and Manoeuvre sight distance.	…….	...../...../.....	☐
2.16	Check widening of lanes on curves.	…….	...../...../.....	☐

3.3.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.3.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.4 Design Checklist 3 - Vertical road alignment

3.4.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
3.1	Check that grades conform to maximum and minimum requirements as per Austroads guides.	…….	...../...../.....	☐
3.2	Check that vertical clearances to overbridges and services conform to standards.	…….	...../...../.....	☐
3.3	Check that there is adequate vertical sight distance for drivers and pedestrians.	…….	...../...../.....	☐
3.4	Check that there is adequate cover to drainage structures or services.	…….	...../...../.....	☐
3.5	Check that there is adequate vertical alignment for disposal of surface	…….	...../...../.....	☐

		By	Date	NA
	drainage from properties and road.			
3.6	Check that grades conform to 1:100 year flood levels (or required planning flood return frequency).	…….	...../...../.....	☐
3.7	Check that vertical alignment is compatible with property access.	…….	...../...../.....	☐
3.8	Check that gradients on intersecting roads do not exceed the cross slope of the through pavement and no greater than 3% at give way and stop signs.	…….	...../...../.....	☐
3.9	Check that there is acceptable sight distance for all accesses to roundabouts (or systems for reducing speed are provided).	…….	...../...../.....	☐
3.10	Check that alignment coordination with horizontal alignment is in conformance with the Austroads design guides referenced in Council Engineering Specifications.	…….	...../...../.....	☐
3.11	Identify and resolve conflict with existing public utility services and not referred to construction sorting by the construction contractor.	…….	...../...../.....	☐
3.12	Document vertical road alignment set out data on the longitudinal sections.	…….	...../...../.....	☐

		By	Date	NA
3.13	Check that sag curves are designed for headlight sight distance.	……..	...../...../.....	☐
3.14	Check that intersections are located as per Council's Engineering Design Specification.	……..	...../...../.....	☐

3.4.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.4.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.5 Design Checklist 4 - Road cross-sections

3.5.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
4.1	Document complete dimensions on typical cross-sections.	……..	...../...../.....	☐
4.2	Document kerb & gutter, road safety barrier and surface drainage on typical cross-sections.	……..	...../...../.....	☐
4.3	Document batter	……..	...../...../.....	☐

		By	Date	NA
	slopes and batter treatment where appropriate.			
4.4	Document pavement description and surface treatment including geotechnical reference.	…….	...../...../.....	☐
4.5	Document property boundaries, service allocations and location of known existing underground services and pathway treatments.	…….	...../...../.....	☐
4.6	Document cross-sections to define all variations and width transitions.	…….	...../...../.....	☐
4.7	Document cross-sections allowing for assessment of impact of road level on adjoining property.	…….	...../...../.....	☐
4.8	Verify the stability of embankment slopes, batters and retaining walls as satisfactory.	…….	...../...../.....	☐
4.9	Check that cross section reference level conforms with vertical road alignment.	…….	...../...../.....	☐

3.5.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.5.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.6 Design Checklist 5 - Road and interallotment drainage

3.6.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
5.1	Document existing surface drainage and upstream catchments.	…….	...../...../.....	☐
5.2	Check that hydrological data is current.	…….	...../...../.....	☐
5.3	Make hydrologic and hydraulic design calculations available for audit.	…….	...../...../.....	☐
5.4	Check that underground drainage and structures do not conflict with public utility services.	…….	...../...../.....	☐
5.5	Check that the designed drainage lines are compatible with existing incoming lines and outgoing lines.	…….	...../...../.....	☐
5.6	Document pipeline length, type, size, class and bedding requirements for each drainage line.	…….	...../...../.....	☐
5.7	Check that height of fill over drainage lines is within recommended practical limits.	…….	...../...../.....	☐
5.8	Document drainage provisions for local depressions, e.g. median areas or areas adjacent to fills.	…….	...../...../.....	☐
5.9	Check that the effect of headwater and back-up water on private property is satisfactory and non-	…….	...../...../.....	☐

		By	Date	NA
	intrusive.			
5.10	Document subsurface drainage by line and level if required. Ensure flushing points and marker posts or plates are specified	…….	...../...../.....	☐
5.11	Document batter drains for fills and cuttings if required.	…….	...../...../.....	☐
5.12	Consider the height and energy level of downstream drainage including exit velocity.	…….	...../...../.....	☐
5.13	Locate drainage structures and flowpaths to ensure safe vehicular and pedestrian transit.	…….	...../...../.....	☐
5.14	Document drainage structure number, set out, type and pipe on the drainage plans and schedule of drainage elements.	…….	...../...../.....	☐
5.15	Identify 100yr emergency overland flowpaths allowing for possible blockages to minimise impact on private property.	…….	...../...../.....	☐
5.16	Check that road drainage conforms with Council's drainage design criteria.	…….	...../...../.....	☐
5.17	Check that interallotment drains conform with Council's Pipe size and pits specification and ARR rainfall data.	…….	...../...../.....	☐
5.18	Document appropriate land stabilisation and velocity controls to	…….	...../...../.....	☐

		By	Date	NA
	pipe systems, open channels and embankments to prevent scour.			
5.19	For flood controlled allotments ensure, the floor height controls are compatible with road and drainage levels as specified by town planning or from a flood study.	…….	...../...../.....	☐
5.20	Ensure that nominal cross road drainage pipe and pipe spacings are in accordance with Austroads 5A & 5B	…….	...../...../.....	☐
5.21	Ensure that stream crossings are selected in accordance with Austroads 5A & 5B	…….	...../...../.....	☐

3.6.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.6.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.7 Design Checklist 6 - Pavement design

3.7.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
6.1	Document pavement design and surface treatment on the typical road and/or pathways and cycleways cross-sections. Document any variations on the specific cross-sections.	…….	...../...../.....	☐
6.2	Assess geotechnical data and keep records of design calculations for pavement design recommendations.	…….	...../...../.....	☐
6.3	Check that the pavement design conforms to Austroads AGPT02 and AGPT05 and/or the *D10 Pathways and cycleways (Design)* worksection for adequacy.	…….	...../...../.....	☐

3.7.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.7.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.8 Design Checklist 7 - Bridge/major culvert design

3.8.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
7.1	Check that the design engineer is suitably experienced in the relevant field and who has or is eligible for NER registration with Engineers Australia.	…….	...../...../.....	☐
7.2	Assess geotechnical data for adequacy and keep records.	…….	...../...../.....	☐
7.3	Check that the type and functional dimensions of the bridges conform to AS 5100 series, AS 4100, AS 3600, AS 1684 series, AS/NZS 1170 series and AS/NZS 5131.	…….	...../...../.....	☐
7.4	Document the type and class of all materials.	…….	...../...../.....	☐
7.5	Keep records of all significant design calculations and make available for audit.	…….	...../...../.....	☐
7.6	Check that the exit velocity for flow on the downstream side of the structure will not cause scour erosion. Refer to	…….	...../...../.....	☐

		By	Date	NA
	Austroads Hydraulic Design of Waterway Structures			

3.8.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.8.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.9 Design Checklist 8 - Erosion and sedimentation control plans (ESCP)

3.9.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
8.1	Check that the ESCP and supporting design documents conforms to the *D11 Control of erosion and sedimentation (Design)* worksection for the construction and operational phase and includes: Construction detail drawings. Remedial action plans for areas requiring corrective action.	…….	……/……/……	☐
8.2	Check that the erosion and sedimentation control conforms to development consent conditions and state environmental legislations.	…….	……/……/……	☐
8.3	Check that the soil management plans and water management plan conforms to *D11 Control of erosion and sedimentation (Design)* worksection and to state and local government authority requirements.	…….	……/……/……	☐
8.4	Check that stormwater management conforms to the *D09 Stormwater drainage (Design)* worksection.	…….	……/……/……	☐

3.9.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.9.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.10 Design checklist 9 - Pathways and cycleways design

3.10.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
9.1	Check that the pathway location and features are in accordance with *D10 Pathways and cycleways (Design)*.	…….	...../...../.....	☐
9.2	Check that there is approved conflict with existing services by reference to Dial before you dig.	…….	...../...../.....	☐
9.3	Check that cycleway and shared pedestrian lane widths conform to *D10 Pathways and cycleways (Design).*	…….	...../...../.....	☐
9.4	Check that the vertical and horizontal alignment is adequate in relation to clearance of other hazards.	…….	...../...../.....	☐
9.5	Check that there is adequate horizontal sight distance for cyclists and pedestrians.	…….	...../...../.....	☐
9.6	Check that the design pavement structure is in accordance with *D10 Pathways and cycleways (Design).*	…….	...../...../.....	☐
9.7	Check that the path surface drains away without ponding and that adjacent drainage systems are properly designed and functioning.	…….	...../...../.....	☐

3.10.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.10.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.11 Design Checklist 10 – Water supply

3.11.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
10.1	Check that the design engineer is suitably experienced in the relevant field and who has or is eligible for NPER registration with Engineers Australia for water supply.	…….	...../...../.....	☐
10.2	Check that a practicing registered Surveyor performed the survey.	…….	...../...../.....	☐
10.3	Assess geotechnical data for adequacy and keep records.	…….	...../...../.....	☐
10.4	Check that the type and functional dimensions of the reticulation and any pump station meet Councils and appropriate Australian Standards, and are compatible with WSA 03.	…….	...../...../.....	☐
10.5	Document the type and class of all materials, fittings, joints, and plant, pumps special requirements for crossings and protection.	…….	...../...../.....	☐
10.6	Keep records of all significant design calculations and make available for audit.	…….	...../...../.....	☐
10.7	Check that the design conforms to requirements of all Statutory Authorities.	…….	...../...../.....	☐

		By	Date	NA
10.8	Check the design conforms to any development consent conditions.	…….	...../...../.....	☐

3.11.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.11.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

3.12 Design Checklist 11 – Sewerage system

3.12.1 Checkpoints

Initial and date the following checkpoints or tick box if not applicable.

		By	Date	NA
11.1	Check that the design engineer is suitably experienced in the relevant field and who has or is eligible for NPER registration with Engineers Australia for sewerage design.	…….	...../...../.....	☐
11.2	Check that a practicing registered Surveyor performed the survey.	…….	...../...../.....	☐
11.3	Assess geotechnical data for adequacy and keep records.	…….	...../...../.....	☐
11.4	Check that the type and functional dimensions of the reticulation and any pump station meet Councils and appropriate Australian Standards, and are compatible with WSA 02.	…….	...../...../.....	☐
11.5	Document the type and class of all materials, fittings, joints, plant, pumps and special requirements for crossings and protection.	…….	...../...../.....	☐
11.6	Keep records of all significant design calculations and make available for audit.	…….	...../...../.....	☐
11.7	Check that the design conforms to requirements of all Statutory Authorities.	…….	...../...../.....	☐

		By	Date	NA
11.8	Check that the design conforms to development consent conditions.	…….	...../...../.....	☐

3.12.2 Certified documents

Include the following certified documents:

List additional certified documents provided:

3.12.3 Non-conformance

Describe any special features of the project and document any variations from Council or State Government Authority requirements.

4 Annexure - Referenced documents

The following documents are incorporated into this worksection by reference:

AS/NZS 1170		Structural design actions
AS 1684		Residential timber-framed construction
AS 3600	2018	Concrete structures
AS 4100	1998	Steel structures
AS 5100		Bridge design
AS/NZS 5131	2016	Structural steelwork - Fabrication and erection
AS/NZS ISO 9000	2016	Quality management systems - Fundamentals and vocabulary
AS/NZS ISO 9001	2016	Quality management systems - Requirements
AS/NZS ISO 10005	2018	Quality management systems - Guidelines for quality plans
ARR	2019	Australian rainfall and runoff (ARR) - A guide to flood estimation
Austroads AGRD 05A & 05B		Drainage
WSA 02	2014	Gravity Sewerage Code of Australia
WSA 03	2011	Water Supply Code of Australia