



AUS-SPEC

Infrastructure Specifications

0010 Quality Requirements for Design



0010 QUALITY REQUIREMENTS FOR DESIGN

IMPORTANT: This document has been adapted from the NATSPEC suite of specification templates for use in the MidCoast Council area by both Council and industry. NATSPEC regularly updates the base templates (currently in April and October each year), and Council may incorporate changes into its version of AUS-SPEC from time to time. To assist in highlighting any changes made by Council to the NATSPEC templates, the following conventions are used.

- See ANNEXURE M at the end of this document which contains (where practical) MidCoast Council customisations (also known as 'office master' text). References to the Annexure are to also be inserted at relevant clauses in the main body of the document.
- Where content is added to the main body of the document, it is to be shown **in brown text like this**.
- Where content is deleted or excluded from the main body of the document, it is to be shown ~~struck through like this~~. Such clauses are to have no effect.

Where there is a conflict between main body text and MidCoast Council specific clauses, Council's specific clauses shall prevail.

1 GENERAL

1.1 INTRODUCTION

Worksection application

Description: This worksection is applicable to providing a quality management system consistent with 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

General

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

1.3 STANDARDS

General

Standard: To AS/NZS ISO 9001.

1.4 INTERPRETATION

Abbreviations

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

- **CPEng: Chartered Professional Engineer (accreditation by Engineers Australia).**
- **NER: National Engineering Register by Engineers Australia.**
- **RPEng: Registered Professional Engineer (accreditation by Professionals Australia).**
- **RPEQ: Registered Professional Engineer of Queensland**
- **QMS: Quality management system.**

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.**
- **Designer: a professional engineer or Registered Land Surveyor with relevant experience and who is responsible for signing off on the completed design before it is implemented. Submit details of accreditation and qualifications along with the design.**

- Hold point: A mandatory verification position in the contract beyond which work cannot proceed without the designated authorisation.
- Non-conformance: The non-fulfilment of documented requirements.
- Professional engineer: A person who is:
 - . If legislation is applicable: A registered professional engineer in the relevant discipline who has appropriate experience and competence in the relevant field.
 - . If legislation is not applicable: **Accredited in the** relevant discipline **as a CPEng, NER, RPEng and/or RPEQ**, and has appropriate experience and competence in the relevant field.
- Quality design checklists: Forms completed during the design process verifying key steps, and records.
- Records: Documents and data, no longer subject to alteration, that provides 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

System requirements

QMS: Plan, develop and maintain a documented QMS conforming to this worksection and consistent with 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

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 **and prior to final subdivision or acceptance into Defects Liability Period**. See Clause M3.

Design quality plan

Requirement: Provide a design Quality Plan **consistent with** AS/NZS ISO 9001 and AS/NZS ISO 10005. See Clause M4. Include the following:

- Design program including 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.
- 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.

Design input

Requirement: Identify, document and review for adequacy the following:

- Principal's brief.
- Site information, including survey information, geotechnical reports, [Dial Before You Dig information](#), [environmental reports](#), hydrology, local Environmental plans, [Heritage Listings and Development Approvals](#).
- Codes of practice, Development Control Plans (DCPs) and Council Engineering requirements.
- Regulatory and statutory requirements.
- Performance criteria.
- Design criteria listed after review of abovementioned items.
- Review: Give notice if the design inputs do not provide sufficient information for verification.

2.3 REVIEW, VERIFICATION AND VALIDATION

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.

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.

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 validation.

Certification

Requirement: Submit a **Design Report certified** by the designer, accompanied by drawings and specification, conforming to the design certificate and checklists included in **Annexure A** at the following stages:

- **Concept Design Stage**
- **Preliminary design stage.**
- **Final design stage**
- **Issued for Construction Plans.**

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

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 designer's premises.

2.4 CONTROL OF NON-CONFORMANCE

See AS/NZS ISO 9001 clause 8.7.

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**Requests for changes by Principal Certifier**

Following review, the Principal Certifier (e.g. Council) shall provide a list of changes requested for each stage of the design. Each change is to be implemented by the designer in the proceeding stage, prior to resubmission.

Design changes

See AS/NZS ISO 9001 clause 8.3.6.

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.
- Verification of implementation 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.

2.6 CONTROL OF DOCUMENTATION

See AS/NZS ISO 9001 clause 7.5.3.

Documentation

Requirement: Control and retain documents and data relating to the project, including from the Principal, other consultants or subconsultants and suppliers.

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.

Design change register: Record changes to documents after issue for construction.

2.7 CONTROL OF RECORDS**Records**

Requirement: Retain design records in a format **that is readily accessible.**

Copies of records: If a consultant or subconsultant is engaged in preparing the design, the copies of the records will be made 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 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

Design certificate

Project title:	
Documentation no:	
Designer:	

I certify that the documentation noted above represents a design in conformance with the following checklists.

I certify that this design conforms to current Australian or International standards, industry guidelines, Council's design specifications 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:

- Any Development Consent (DA) that applies to the land,
- The Environmental Planning and Assessment Act, related Regulations and Environmental Planning Instruments including Council's Local Environmental Plan (LEP) and relevant State Environmental Planning Policies (SEPP), and
- The Protection of the Environment Operations Act.
- The NSW Heritage Act

I certify that all structural/civil/hydraulic elements have been designed by an engineer suitably experienced in the relevant field and who has or is eligible for NPER registration with Engineers Australia, RPEQ and/or RPEng registration or a Registered Land Surveyor suitably experienced in the relevant field.

Date:	
Contact phone:	
Contact postal address:	
Design Engineer/Surveyor:	
Qualifications:	
Signature	
ABN:	

3.2 MIDCOAST COUNCIL

DESIGN JOB CHECK SHEET (GENERAL)

I&DS File: /

Locality : Road :
 Description of Proposed Works.....
 Date Received: Target Date: MCC file No's : Plan No:
 Job No: xxxx - _ _ _ _ - xxxx Budget : \$ Adjoining I&DS files:

INVESTIGATION & SURVEY

File prep. :

- Topo site plan, DP's, Prop. Owners, Water, Sewer, Zoning,
- Dial 1100 Before You Dig search
- Traffic Data to file – If no data, arrange traffic data collection
- Search for existing adjacent engineering plans and I&DS Job files
- Inspection of Local Environmental Plan Heritage Schedule.
- Acid Sulphate Soil probability map
- Proposed Survey/Work letter issued to Owners/ Occupiers
- Public Transport routes
- B Double routes
- Cycleway facilities & routes

Survey, Inspections & Investigations:

- Survey completed
 Date/...../.....
 Surveyor
- Site inspection with Coordinator/ Engineer
 Date...../...../.....
- Inspection for assessment under Part 5 of EP&A Act.
 Assessed by
 Date .../.../....
- Geotech. Investigation by
 Requested/...../..... Received/...../.....

DESIGN (in accordance with AUSPEC No.1 and RTA Road Design Guide)

- Road centreline and kerb gradings Vertical Curves/ Horizontal Curves
- Consider your proposed alignment, any land acquisitions required > liaise ASAP with TA Roads Admin Coordinator
- Sufficient levels for set-out and construction Kerb return profiles
- Cross sections: Examine and check information, ## Check clearances to public utilities ##
 ## Check currency of Dial Before You Dig search ## Telstra/Optus Electricity Water
 Sewer
- Alterations to public utilities Alterations to vehicular access
- Road intersections Footpaths Alterations to postal services
 (letter boxes)
- Line marking Signage

DRAINAGE (AR&R)

- Revise waterway calculations
- Check pipe drainage system : Inlet flows and type, Pipe sizes, Grades & velocities, Location in road
- Ensure drainage information is on plan, long section and road cross sections,
- Erosion & Sedimentation control – permanent and temporary,
- Drainage Compilation Plan to be updated at end of design stage in pencil (WAE may differ to design), and amend any differences discovered in existing drainage or any proposed drainage amended during construction.
- Grade subsoil Grade tabledrains

GENERAL

- General Notes sheet in plan set
- Accessibility assessed?
- Prepare quantities and estimate on standard form (Copy of estimate to file), Safety
- assessed and noted in Design Notes
- Datum, North Point & Azimuth on plan Streetscapes
- assessed and implemented
- Enter Plan Number onto, and update, I&DS database
- (R:Asset_Planning\Design_Invest\ldsfile\IDSF2FILE2.xlsm)
- Check plan Title Blocks, I&DS File No., Dates, Sheet numbering, Total number of sheets, Plan No., Notes on plan etc.
- Check on plot: Plan, Longitudinal Section, Services, Access, Building descriptions, Lot & DP Numbers
- Check for: Sufficient detail and information (dimensions, survey connections, coords, stations etc. for set-out), Linework, Lettering
- Check for references to Standard Drawings
- Preliminary copy of plan to client for comments/...../..... (Should be marked as 'Preliminary Copy')
- Request Land Resource Management to provide an REF/...../..... (copy of REF to IDS file)
- Copy of plan for checking to Team Leader Senior Designer/...../.....

PLANS COMPLETED

Final copy of plans (or parts of plans) to:	No. Copies	Date	
<input type="checkbox"/> * Approved TL Design	1	*
Only if land acquisitions required			
<input type="checkbox"/> # Transport NSW Services	1	#
Only if Transport NSW funded			
<input type="checkbox"/> Development / Quality Section	1	
<input type="checkbox"/> IDS File	1 + REF + Final Estimate	
<input type="checkbox"/> Client	2 + REF + Schedule of Quantities	
<input type="checkbox"/> Telstra	1	
<input type="checkbox"/> Water Services	1	
<input type="checkbox"/> Essential Energy	1	

3.3 DESIGN CHECKLIST 1 - DOCUMENTATION OF EXISTING SITE FEATURES

This checklist is applicable to the following design requirements:

- 0021 Site regrading.
- Council's survey brief and any policies including environment, heritage, etc.

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. Pipe diameter and drainage to be included./...../.....	<input type="checkbox"/>
1.2	Check detail survey by site inspection for existing property descriptions, boundaries, structures, fences and accesses./...../.....	<input type="checkbox"/>
1.3	Check detail survey of contours as representative of site terrain./...../.....	<input type="checkbox"/>
1.4	Document trees >150mm Ø and significant environmental features affected by the works including within the roadside safety Clear Zone./...../.....	<input type="checkbox"/>
1.5	Document significant features to heritage within the Works boundaries./...../.....	<input type="checkbox"/>
1.6	Document existing public and private property likely to be affected by the design./...../.....	<input type="checkbox"/>
1.7	Document survey (of contours and features) and benchmarks of the site and up to 3 metres within neighbouring lots./...../.....	<input type="checkbox"/>
1.8	Document existing public utility services (DBYD) and house / property service connections horizontally and vertically/...../.....	<input type="checkbox"/>

		By	Date	NA
1.9	Document existing property accesses and show driveway alteration in accordance with MCC relevant Standard Drawings/...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Drawings including general layout, drainage and road layout plans
List additional certified documents provided:

Non-conformance

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

3.4 DESIGN CHECKLIST 2 - HORIZONTAL ROAD ALIGNMENT

This checklist is applicable to the following design requirements:

- 0041 Geometric rural road design - sealed.
- 0052 Geometric rural road design - unsealed.
- 0044 Pathways and cycleways (Design).
- 0061 Bridges and related structures.

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./...../.....	<input type="checkbox"/>
2.2	Check that alignment is adequate in relation to clearance of roadside hazards./...../.....	<input type="checkbox"/>
2.3	Check that there is adequate horizontal sight distance for drivers and pedestrians, including/...../.....	<input type="checkbox"/>

		By	Date	NA
	at driveways.			
2.4	Check that there is approved conflict with existing services by reference to dial before you dig./...../.....	<input type="checkbox"/>
2.5	Check that road widths and lanes conform to Council's traffic design requirements./...../.....	<input type="checkbox"/>
2.6	Check that bridge alignment is compatible with the road alignment./...../.....	<input type="checkbox"/>
2.7	Check for adequate pedestrian, pram, bicycle and parking provisions./...../.....	<input type="checkbox"/>
2.8	Check for adequate provision for large vehicles such as buses, garbage trucks and emergency vehicles./...../.....	<input type="checkbox"/>
2.9	Check that intersections conform to the turning requirements of design traffic, including emergency vehicles./...../.....	<input type="checkbox"/>
2.10	Check adequate pavement width tapers and merges, including Limit of Works Linkup with existing carriageway to MCC Standard Drawings/...../.....	<input type="checkbox"/>
2.11	Identify and resolve any levels of conflict with existing utility services./...../.....	<input type="checkbox"/>
2.12	Document horizontal road alignment set out data./...../.....	<input type="checkbox"/>
2.13	Check provision of superelevation and superelevation development lengths./...../.....	<input type="checkbox"/>
2.14	Check adequate sight distance for corners./...../.....	<input type="checkbox"/>
2.15	Check adequate Overtaking sight distance and Manoeuvre sight distance./...../.....	<input type="checkbox"/>

		By	Date	NA
2.16	Check widening of lanes on curves./...../.....	<input type="checkbox"/>
2.17	Verify that all of the proposed road works are within the Road Reserve or document the extent of potential acquisitions/...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Drawings including general layouts, typical road plans, cross-sections and longitudinal sections, intersection layouts
List additional certified documents provided:

Non-conformance

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

3.5 DESIGN CHECKLIST 3 - VERTICAL ROAD ALIGNMENT

This checklist is applicable to the following design requirements:

- 0041 Geometric rural road design - sealed.
- 0052 Geometric rural road design - unsealed.
- 0044 Pathways and cycleways (Design).
- 0061 Bridges and related structures.

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./...../.....	<input type="checkbox"/>
3.2	Check that vertical clearances to over bridges, other/...../.....	<input type="checkbox"/>

		By	Date	NA
	structures and services conform to standards.			
3.3	Check that there is adequate vertical sight distance for drivers and pedestrians, including at driveways./...../.....	<input type="checkbox"/>
3.4	Check that there is adequate cover to drainage structures or services./...../.....	<input type="checkbox"/>
3.5	Check that there is adequate vertical alignment for disposal of surface drainage from properties and road./...../.....	<input type="checkbox"/>
3.6	Check that grades conform to 1:100 year flood levels (or required planning flood return frequency)./...../.....	<input type="checkbox"/>
3.7	Check that vertical alignment is compatible with property access./...../.....	<input type="checkbox"/>
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./...../.....	<input type="checkbox"/>
3.9	Check that there is acceptable sight distance for all accesses to roundabouts (or systems for reducing speed are provided)./...../.....	<input type="checkbox"/>
3.10	Check that alignment coordination with horizontal alignment is in conformance with the Austroads design guides referenced in the AUS-SPEC specifications./...../.....	<input type="checkbox"/>
3.11	Identify and resolve conflict with existing public utility services/...../.....	<input type="checkbox"/>

		By	Date	NA
	and not referred to construction.			
3.12	Document vertical road alignment set out data on the longitudinal sections./...../.....	<input type="checkbox"/>
3.13	Check that sag curves are designed for headlight sight distance./...../.....	<input type="checkbox"/>
3.14	Check that intersections are located as per AUS-SPEC design specification./...../.....	<input type="checkbox"/>
3.15	Check for potential for aquaplaning, interaction between grades / crossfalls.			

Certified documents

Include the following certified documents:

Drawings including road plans, longitudinal sections and cross-sections.
List additional certified documents provided:

Non-conformance

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

3.6 DESIGN CHECKLIST 4 - ROAD CROSS-SECTIONS

This checklist is applicable to the following design requirements:

- 0041 Geometric rural road design - sealed.
- 0052 Geometric rural road design - unsealed.
- 0044 Pathways and cycleways (Design).
- 0061 Bridges and related structures.

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./...../.....	<input type="checkbox"/>
4.2	Document kerb & gutter or edge of seal/asphalt, road safety barrier, guide posts, subsurface drainage and surface drainage on typical cross-sections./...../.....	<input type="checkbox"/>
4.3	Document batter slopes and batter treatment where appropriate./...../.....	<input type="checkbox"/>
4.4	Document pavement description and surface treatment on typical cross section including geotechnical reference with reference to pavement compaction requirements/...../.....	<input type="checkbox"/>
4.5	Document property boundaries, fences, service allocations and location of known existing underground services and pathway treatments./...../.....	<input type="checkbox"/>
4.6	Document cross-sections to define all variations and width transitions./...../.....	<input type="checkbox"/>
4.7	Document cross-sections allowing for assessment of impact of road level on adjoining property including driveway slopes and sight distance./...../.....	<input type="checkbox"/>
4.8	Verify the stability of embankment slopes, batters and retaining walls as satisfactory./...../.....	<input type="checkbox"/>
4.9	Check that cross section reference level conforms with vertical road alignment./...../.....	<input type="checkbox"/>
4.10	Ensure no conflict between driven barrier fence posts and drainage culverts or provide for alternative/...../.....	<input type="checkbox"/>
4.11	Document existing edge of seal on all cross sections/...../.....	<input type="checkbox"/>

		By	Date	NA
4.12	Document guardrail warrants for drop offs/...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Drawings including road plans, cross-sections and longitudinal sections.
List additional certified documents provided:

Non-conformance

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

3.7 DESIGN CHECKLIST 5 - ROAD AND INTERALLOTMENT DRAINAGE

This checklist is applicable to the following design requirements:

- 0021 Site regrading.
- 0043 Subsurface drainage (Design).
- 0074 Stormwater drainage (Design).

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./...../.....	<input type="checkbox"/>
5.2	Check that hydrological data is current./...../.....	<input type="checkbox"/>
5.3	Make hydrologic and hydraulic design calculations available for audit./...../.....	<input type="checkbox"/>
5.4	Check that underground drainage and structures do not conflict with public utility services./...../.....	<input type="checkbox"/>

		By	Date	NA
5.5	Check that the designed drainage lines are compatible with existing incoming lines and outgoing lines./...../.....	<input type="checkbox"/>
5.6	Document pipeline length, type, size, class and bedding requirements for each drainage line./...../.....	<input type="checkbox"/>
5.7	Check that height of fill over drainage lines is within recommended practical limits./...../.....	<input type="checkbox"/>
5.8	Document drainage provisions for local depressions, e.g. median areas or areas adjacent to fills./...../.....	<input type="checkbox"/>
5.9	Check that the effect of headwater and back-up water on private property is satisfactory and non intrusive./...../.....	<input type="checkbox"/>
5.10	Document subsurface drainage by line and level if required./...../.....	<input type="checkbox"/>
5.11	Document batter drains for fills and cuttings if required./...../.....	<input type="checkbox"/>
5.12	Consider the height and energy level of downstream drainage including exit velocity./...../.....	<input type="checkbox"/>
5.13	Locate drainage structures and flowpaths to ensure safe vehicular and pedestrian transit./...../.....	<input type="checkbox"/>
5.14	Document drainage structure number, set out, type and pipe on the drainage plans and schedule of drainage elements./...../.....	<input type="checkbox"/>
5.15	Identify emergency overland flowpaths to minimise impact on private property./...../.....	<input type="checkbox"/>
5.16	Check that road drainage conforms with Council's/...../.....	<input type="checkbox"/>

		By	Date	NA
	drainage design criteria.			
5.17	Check that interallotment drains conform with Council's Pipe size and pits specification and ARR rainfall data./...../.....	<input type="checkbox"/>
5.18	Document appropriate land stabilisation and velocity controls to pipe systems, open channels and embankments to prevent scour./...../.....	<input type="checkbox"/>
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./...../.....	<input type="checkbox"/>
5.20	Ensure that nominal cross road drainage pipe and pipe spacings are in accordance with the relevant worksections 0041 Geometric road design and 0052 Geometric rural road design - unsealed/...../.....	<input type="checkbox"/>
5.21	Ensure that stream crossings are selected in accordance with 0052 Geometric rural road design - unsealed./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Drawings including drainage plan, schedule of drainage elements, drainage profiles and drainage structure details.
List additional certified documents provided:

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Non-conformance

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

3.8 DESIGN CHECKLIST 6 - PAVEMENT DESIGN

This checklist is applicable to the following design requirements:

- 0042 Pavement design - sealed.
- 0054 Rural pavement design - unsealed.
- 0044 Pathways and cycleways (Design).

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./...../.....	<input type="checkbox"/>
6.2	Check that the pavement design conforms to the relevant road 0042 Pavement design worksection and 0052 Geometric rural road design – unsealed worksection and/or the 0044 Pathways and cycleways (Design) worksection for adequacy./...../.....	<input type="checkbox"/>
6.3	Assess geotechnical data and keep records of design calculations for pavement design recommendations./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

<i>Drawings including typical road cross-sections.</i>

List additional certified documents provided:

Non-conformance

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

3.9 DESIGN CHECKLIST 7 - BRIDGE/MAJOR CULVERT DESIGN

This checklist is applicable to the following design requirements:

- 0061 Bridges and related structures.

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./...../.....	<input type="checkbox"/>
7.2	Assess geotechnical data for adequacy and keep records./...../.....	<input type="checkbox"/>
7.3	Check that the bridges conform to AS 5100 series, AS 4100, AS 3600, AS 1684 series, AS/NZS 1170 series and AS/NZS 5131. Consider fish passage, compliance, inspection access./...../.....	<input type="checkbox"/>
7.4	Document the type and class of all materials./...../.....	<input type="checkbox"/>
7.5	Keep records of all significant design calculations and make available for audit./...../.....	<input type="checkbox"/>
7.6	Check that the velocity for flow upstream, through and on the downstream side of the structure will not cause scour erosion./...../.....	<input type="checkbox"/>

		By	Date	NA
7.7	Check road alignment with the bridge, inlet/outlet controls identified, hydraulic analysis/...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Drawings including structural general arrangements, sections, reinforcement and foundation details
List additional certified documents provided:

Non-conformance

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

3.10 DESIGN CHECKLIST 8 - EROSION AND SEDIMENTATION CONTROL PLANS (ESCP)

This checklist is applicable to the following design requirements: 0022 Control of erosion and sedimentation (Design). 0074 Stormwater drainage (Design). **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 0022 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./...../.....	<input type="checkbox"/>
8.2	Check that the erosion and sedimentation control conforms to development consent conditions and state/...../.....	<input type="checkbox"/>

		By	Date	NA
	environmental legislations.			
8.3	Check that the soil management plans and water management plan conforms to 0022 Control of erosion and sedimentation (Design) worksection and to the LANDCOM 'Blue Book' and MCC (Standard Drawing SD0109) requirements./...../.....	<input type="checkbox"/>
8.4	Check that stormwater management conforms to the 0074 Stormwater drainage (Design) worksection./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Soil and Water Management Plan if warranted by the scale of the proposal with reference to Managing Urban Stormwater: Soils and construction – Volume 1 ('the blue book')
Erosion and Sediment Control Plans and drawings
List additional certified documents provided:

Non-conformance

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

3.11 DESIGN CHECKLIST 9 - PATHWAYS AND CYCLEWAYS DESIGN

This checklist is applicable to the following design requirements:

- 0044 Pathways and cycleways

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 0044 Pathways and/...../.....	<input type="checkbox"/>

		By	Date	NA
	<i>cycleways (Design).</i>			
9.2	Check that there is approved conflict with existing services by reference to Dial before you dig./...../.....	<input type="checkbox"/>
9.3	Check that cycleway and shared pedestrian lane widths conform to <i>0044 Pathways and cycleways (Design).</i>/...../.....	<input type="checkbox"/>
9.4	Check that the vertical and horizontal alignment is adequate in relation to clearance of other hazards./...../.....	<input type="checkbox"/>
9.5	Check that there is adequate horizontal sight distance for cyclists and pedestrians./...../.....	<input type="checkbox"/>
9.6	Check that the design pavement structure is in accordance with <i>0044 Pathways and cycleways (Design).</i>/...../.....	<input type="checkbox"/>
9.7	Check that the path surface drains away without ponding and that adjacent drainage systems are properly designed and functioning./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

<i>Drawings including general layout plans.</i>

List additional certified documents provided:

Non-conformance

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

3.12 DESIGN CHECKLIST 10 - WATER SUPPLY

This checklist is applicable to the following design requirements:

- 0071 Water supply - reticulation (Design)
- 0072 Water supply - pump stations (Design).

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./...../.....	<input type="checkbox"/>
10.2	Check that a practicing registered Surveyor performed the survey./...../.....	<input type="checkbox"/>
10.3	Assess geotechnical data for adequacy and keep records./...../.....	<input type="checkbox"/>
10.4	Check that the type and functional dimensions of the reticulation and any pump station meet the State Department of Public Works and Services guidelines and the appropriate Australian Standards, and are compatible with WSA 03./...../.....	<input type="checkbox"/>
10.5	Document the type and class of all materials, fittings, joints, and plant, pumps special requirements for crossings and protection./...../.....	<input type="checkbox"/>
10.6	Keep records of all significant design calculations and make available for audit./...../.....	<input type="checkbox"/>
10.7	Check that the/...../.....	<input type="checkbox"/>

		By	Date	NA
	design conforms to requirements of all Statutory Authorities.			
10.8	Check the design conforms to any development consent conditions./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Water supply drawings including general layout plans, cross-sections, longitudinal sections and details
List additional certified documents provided:

Non-conformance

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

3.13 DESIGN CHECKLIST 11 - SEWERAGE SYSTEM

This checklist is applicable to the following design requirements:

- 0076 Sewerage systems - reticulation (Design).
- 0077 Sewerage systems - pump stations (Design).

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./...../.....	<input type="checkbox"/>
11.2	Check that a practicing registered Surveyor performed the survey./...../.....	<input type="checkbox"/>
11.3	Assess geotechnical data for adequacy/...../.....	<input type="checkbox"/>

	and keep records.			
11.4	Check that the type and functional dimensions of the reticulation and any pump station meet state Department of Public Works and Services guidelines and the appropriate Australian Standards, and are compatible with WSA 02./...../.....	<input type="checkbox"/>
11.5	Document the type and class of all materials, fittings, joints, plant, pumps and special requirements for crossings and protection./...../.....	<input type="checkbox"/>
11.6	Keep records of all significant design calculations and make available for audit./...../.....	<input type="checkbox"/>
11.7	Check that the design conforms to requirements of all Statutory Authorities./...../.....	<input type="checkbox"/>
11.8	Check that the design conforms to development consent conditions./...../.....	<input type="checkbox"/>

Certified documents

Include the following certified documents:

Sewerage drawings including general arrangements, cross-sections, longitudinal sections and details.

List additional certified documents provided:

Non-conformance

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

4 ANNEXURE B - 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	2020	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
AS/NZS ISO 10006	2018	Quality management systems - Guidelines for quality management in projects
ARR	2019	Australian rainfall and runoff (ARR) - A guide to flood estimation
AUSTROADS		Guide to Road Design
AUSTROADS		Guide to Pavement Technology
AUSTROADS		Guide to Traffic Management
Landcom	2004	Managing urban stormwater, Soils and construction (the 'Blue Book')
MidCoast Council		Development Engineering Handbook
MidCoast Council		AUS-SPEC Infrastructure Specifications
WSA 02	2014	Gravity Sewerage Code of Australia
WSA 03	2011	Water Supply Code of Australia

5 ANNEXURE M – MIDCOAST COUNCIL SPECIFIC CLAUSES

M1.	Variations to or non-conformances with Council's AUS-SPEC are to be evaluated with reference to the procedure in Council's <i>Development Engineering Handbook</i> . Acceptance is to be obtained in writing from: <ul style="list-style-type: none"> a) an authorised representative of Council's Director of Infrastructure and Engineering Services, or b) an accredited certifier where they are the Principal Certifier and hold the relevant accreditation category for the type of work. 	Variation procedure
M2.	This specification applies in addition to any development consent (DA) conditions. If there is any inconsistency, the conditions of consent shall prevail.	DA conditions
M3.	(See Clause 2.2) Project-specific quality records relating to the project stage are to be provided to the Principal Certifier (e.g. Council) as part of any application for a Subdivision Certificate or acceptance of infrastructure into a Defects Liability Period.	Provide quality records
M4.	(See Clause 2.2) Where the design of infrastructure is funded by private Developers, any design Quality Plan is not required to provide details of design resourcing or timelines. Relevant qualifications and experience of personnel are to be included.	Designs for developers

6 AMENDMENT HISTORY

0	30/11/2020	First Published
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