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:

1. If legislation is applicable: A registered professional engineer in the relevant discipline who has appropriate experience and competence in the relevant field.
2. 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

<table>
<thead>
<tr>
<th>Project title:</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Documentation no:</td>
</tr>
<tr>
<td>Designer:</td>
</tr>
</tbody>
</table>

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 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 - _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

**Budget**: $ ..................

**Adjoining I&DS files**: ............

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**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**

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- General Notes sheet in plan set
  - Accessability 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\Idsfile\IDSFILE2.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
- * Approved TL Design 1 ...................... *
  - Only if land acquisitions required
- # Transport NSW Services 1 ...................... #
  - Only if Transport NSW funded
- Development / Quality Section 1 ......................

- IDS File 1 + REF + Final Estimate ......................
- Client 2 + REF + Schedule of Quantities ......................
- Telstra 1 ......................
- Water Services 1 ......................
- 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.

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<tr>
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<tbody>
<tr>
<td>1.1</td>
<td>Check detail survey by site inspection for existing drainage.</td>
<td>………..</td>
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<tr>
<td>1.2</td>
<td>Check detail survey by site inspection for existing property descriptions, boundaries, structures, fences and accesses.</td>
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<tr>
<td>1.3</td>
<td>Check detail survey of contours as representative of site terrain.</td>
<td>………..</td>
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<td>1.4</td>
<td>Document trees &gt;150mm Ø and significant environmental features affected by the works including within the roadside safety Clear Zone.</td>
<td>………..</td>
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<td>1.5</td>
<td>Document significant features to heritage within the Works boundaries.</td>
<td>………..</td>
<td>........./.....</td>
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<tr>
<td>1.6</td>
<td>Document existing public and private property likely to be affected by the design.</td>
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<tr>
<td>1.7</td>
<td>Document survey (of contours and features) and benchmarks of the site and up to 3 metres within neighbouring lots.</td>
<td>………..</td>
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<td>1.8</td>
<td>Document existing public utility services (DBYD) and house / property service connections horizontally and vertically</td>
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</table>
1.9 Document existing property accesses and show driveway alteration in accordance with MCC relevant Standard Drawings

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Certified documents
Include the following certified documents:

- Drawings including general layout, drainage and road layout plans

List additional certified documents provided:

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<th>By</th>
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</table>

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.

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<tr>
<td>2.4 Check that there is approved conflict with existing services by reference to dial before you dig.</td>
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<td>…/…./…..</td>
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<tr>
<td>2.5 Check that road widths and lanes conform to Council's traffic design requirements.</td>
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<td>…/…./…..</td>
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<tr>
<td>2.6 Check that bridge alignment is compatible with the road alignment.</td>
<td>…………..</td>
<td>…/…./…..</td>
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<tr>
<td>2.7 Check for adequate pedestrian, pram, bicycle and parking provisions.</td>
<td>…………..</td>
<td>…/…./…..</td>
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<tr>
<td>2.8 Check for adequate provision for large vehicles such as buses, garbage trucks and emergency vehicles.</td>
<td>…………..</td>
<td>…/…./…..</td>
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<tr>
<td>2.9 Check that intersections conform to the turning requirements of design traffic, including emergency vehicles.</td>
<td>…………..</td>
<td>…/…./…..</td>
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<tr>
<td>2.10 Check adequate pavement width tapers and merges, including Limit of Works Linkup with existing carriageway to MCC Standard Drawings</td>
<td>…………..</td>
<td>…/…./…..</td>
</tr>
<tr>
<td>2.11 Identify and resolve any levels of conflict with existing utility services.</td>
<td>…………..</td>
<td>…/…./…..</td>
</tr>
<tr>
<td>2.12 Document horizontal road alignment set out data.</td>
<td>…………..</td>
<td>…/…./…..</td>
</tr>
<tr>
<td>2.13 Check provision of superelevation and superelevation development lengths.</td>
<td>…………..</td>
<td>…/…./…..</td>
</tr>
<tr>
<td>2.14 Check adequate sight distance for corners.</td>
<td>…………..</td>
<td>…/…./…..</td>
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<tr>
<td>2.15 Check adequate Overtaking sight distance and Manoeuvre sight distance.</td>
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<tr>
<td>2.16</td>
<td>Check widening of lanes on curves.</td>
<td>.............</td>
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<tr>
<td>2.17</td>
<td>Verify that all of the proposed road works are within the Road Reserve or document the extent of potential acquisitions</td>
<td>.............</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th></th>
<th>By</th>
<th>Date</th>
<th>NA</th>
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</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Check that grades conform to maximum and minimum requirements as per Austroads guides.</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td>3.2</td>
<td>Check that vertical clearances to over bridges, other</td>
<td>.............</td>
<td>...../...../.....</td>
</tr>
<tr>
<td></td>
<td>By</td>
<td>Date</td>
<td>NA</td>
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<tr>
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</tr>
<tr>
<td><strong>3.3</strong></td>
<td>Check that there is adequate vertical sight distance for drivers and pedestrians, including at driveways.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.4</strong></td>
<td>Check that there is adequate cover to drainage structures or services.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.5</strong></td>
<td>Check that there is adequate vertical alignment for disposal of surface drainage from properties and road.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.6</strong></td>
<td>Check that grades conform to 1:100 year flood levels (or required planning flood return frequency).</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.7</strong></td>
<td>Check that vertical alignment is compatible with property access.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.8</strong></td>
<td>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.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.9</strong></td>
<td>Check that there is acceptable sight distance for all accesses to roundabouts (or systems for reducing speed are provided).</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.10</strong></td>
<td>Check that alignment coordination with horizontal alignment is in conformance with the Austroads design guides referenced in the AUS-SPEC specifications.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td><strong>3.11</strong></td>
<td>Identify and resolve conflict with existing public utility services</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
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<td></td>
<td>By</td>
<td>Date</td>
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</tr>
<tr>
<td>3.12</td>
<td>Document vertical road alignment set out data on the longitudinal sections.</td>
<td>…………..</td>
<td>…./…./…..</td>
</tr>
<tr>
<td>3.13</td>
<td>Check that sag curves are designed for headlight sight distance.</td>
<td>…………..</td>
<td>…./…./…..</td>
</tr>
<tr>
<td>3.14</td>
<td>Check that intersections are located as per AUS-SPEC design specification.</td>
<td>…………..</td>
<td>…./…./…..</td>
</tr>
<tr>
<td>3.15</td>
<td>Check for potential for aquaplaning, interaction between grades / crossfalls.</td>
<td></td>
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</tr>
</tbody>
</table>

**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.
<p>| | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>4.1</td>
<td>Document complete dimensions on typical cross-sections</td>
<td>By</td>
</tr>
<tr>
<td>4.2</td>
<td>Document kerb &amp; gutter or edge of seal/asphalt, road safety barrier, guide posts, subsurface drainage and surface drainage on typical cross-sections</td>
<td>By</td>
</tr>
<tr>
<td>4.3</td>
<td>Document batter slopes and batter treatment where appropriate</td>
<td>By</td>
</tr>
<tr>
<td>4.4</td>
<td>Document pavement description and surface treatment on typical cross section including geotechnical reference with reference to pavement compaction requirements</td>
<td>By</td>
</tr>
<tr>
<td>4.5</td>
<td>Document property boundaries, fences, service allocations and location of known existing underground services and pathway treatments</td>
<td>By</td>
</tr>
<tr>
<td>4.6</td>
<td>Document cross-sections to define all variations and width transitions</td>
<td>By</td>
</tr>
<tr>
<td>4.7</td>
<td>Document cross-sections allowing for assessment of impact of road level on adjoining property including driveway slopes and sight distance</td>
<td>By</td>
</tr>
<tr>
<td>4.8</td>
<td>Verify the stability of embankment slopes, batters and retaining walls as satisfactory</td>
<td>By</td>
</tr>
<tr>
<td>4.9</td>
<td>Check that cross section reference level conforms with vertical road alignment</td>
<td>By</td>
</tr>
<tr>
<td>4.10</td>
<td>Ensure no conflict between driven barrier fence posts and drainage culverts or provide for alternative</td>
<td>By</td>
</tr>
<tr>
<td>4.11</td>
<td>Document existing edge of seal on all cross sections</td>
<td>By</td>
</tr>
</tbody>
</table>
### 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.

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>5.1</td>
<td>Document existing surface drainage and upstream catchments.</td>
<td>By</td>
</tr>
<tr>
<td>5.2</td>
<td>Check that hydrological data is current.</td>
<td>By</td>
</tr>
<tr>
<td>5.3</td>
<td>Make hydrologic and hydraulic design calculations available for audit.</td>
<td>By</td>
</tr>
<tr>
<td>5.4</td>
<td>Check that underground drainage and structures do not conflict with public utility services.</td>
<td>By</td>
</tr>
<tr>
<td></td>
<td>Check that the designed drainage lines are compatible with existing incoming lines and outgoing lines.</td>
<td>By</td>
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<tr>
<td>5.5</td>
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<tr>
<td>5.6</td>
<td>Document pipeline length, type, size, class and bedding requirements for each drainage line.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.7</td>
<td>Check that height of fill over drainage lines is within recommended practical limits.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.8</td>
<td>Document drainage provisions for local depressions, e.g. median areas or areas adjacent to fills.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.9</td>
<td>Check that the effect of headwater and back-up water on private property is satisfactory and non intrusive.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.10</td>
<td>Document subsurface drainage by line and level if required.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.11</td>
<td>Document batter drains for fills and cuttings if required.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.12</td>
<td>Consider the height and energy level of downstream drainage including exit velocity.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.13</td>
<td>Locate drainage structures and flowpaths to ensure safe vehicular and pedestrian transit.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.14</td>
<td>Document drainage structure number, set out, type and pipe on the drainage plans and schedule of drainage elements.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.15</td>
<td>Identify emergency overland flowpaths to minimise impact on private property.</td>
<td>---------------</td>
</tr>
<tr>
<td>5.16</td>
<td>Check that road drainage conforms with Council's</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>By</td>
<td>Date</td>
</tr>
<tr>
<td>---</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>5.17</td>
<td>Check that interallotment drains conform with Council’s Pipe size and pits specification and ARR rainfall data.</td>
<td>…………..</td>
</tr>
<tr>
<td>5.18</td>
<td>Document appropriate land stabilisation and velocity controls to pipe systems, open channels and embankments to prevent scour.</td>
<td>…………..</td>
</tr>
<tr>
<td>5.19</td>
<td>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.</td>
<td>…………..</td>
</tr>
<tr>
<td>5.20</td>
<td>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.</td>
<td>…………..</td>
</tr>
<tr>
<td>5.21</td>
<td>Ensure that stream crossings are selected in accordance with 0052 Geometric rural road design - unsealed.</td>
<td>…………..</td>
</tr>
</tbody>
</table>

**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:
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.

<table>
<thead>
<tr>
<th></th>
<th>By</th>
<th>Date</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>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.</td>
<td>..........</td>
<td>....../.....</td>
</tr>
<tr>
<td>6.2</td>
<td>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.</td>
<td>..........</td>
<td>....../.....</td>
</tr>
<tr>
<td>6.3</td>
<td>Assess geotechnical data and keep records of design calculations for pavement design recommendations.</td>
<td>..........</td>
<td>....../.....</td>
</tr>
</tbody>
</table>

Certified documents
Include the following certified documents:
Drawings including typical road 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.


3.9 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.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Check that the design engineer is suitably experienced in the relevant field and who has or is eligible for NER registration with Engineers Australia.</td>
<td>By</td>
</tr>
<tr>
<td>7.2</td>
<td>Assess geotechnical data for adequacy and keep records.</td>
<td>By</td>
</tr>
<tr>
<td>7.3</td>
<td>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.</td>
<td>By</td>
</tr>
<tr>
<td>7.4</td>
<td>Document the type and class of all materials.</td>
<td>By</td>
</tr>
<tr>
<td>7.5</td>
<td>Keep records of all significant design calculations and make available for audit.</td>
<td>By</td>
</tr>
<tr>
<td>7.6</td>
<td>Check that the velocity for flow upstream, through and on the downstream side of the structure will not cause scour erosion.</td>
<td>By</td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th></th>
<th>By</th>
<th>Date</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1</td>
<td>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.</td>
<td>**********</td>
<td>../../....../...</td>
</tr>
<tr>
<td>8.2</td>
<td>Check that the erosion and sedimentation control conforms to development consent conditions and state</td>
<td>**********</td>
<td>../../....../...</td>
</tr>
</tbody>
</table>
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.
<table>
<thead>
<tr>
<th></th>
<th>By</th>
<th>Date</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.2</td>
<td>Check that there is approved conflict with existing services by reference to Dial before you dig.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td>9.3</td>
<td>Check that cycleway and shared pedestrian lane widths conform to 0044 Pathways and cycleways (Design).</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td>9.4</td>
<td>Check that the vertical and horizontal alignment is adequate in relation to clearance of other hazards.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td>9.5</td>
<td>Check that there is adequate horizontal sight distance for cyclists and pedestrians.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td>9.6</td>
<td>Check that the design pavement structure is in accordance with 0044 Pathways and cycleways (Design).</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
<tr>
<td>9.7</td>
<td>Check that the path surface drains away without ponding and that adjacent drainage systems are properly designed and functioning.</td>
<td>............</td>
<td>....../...../.....</td>
</tr>
</tbody>
</table>

**Certified documents**

Include the following certified documents:

- Drawings including general 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.
### 3.12 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.

<table>
<thead>
<tr>
<th></th>
<th>By</th>
<th>Date</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>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.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.2</td>
<td>Check that a practicing registered Surveyor performed the survey.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.3</td>
<td>Assess geotechnical data for adequacy and keep records.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.4</td>
<td>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.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.5</td>
<td>Document the type and class of all materials, fittings, joints, and plant, pumps special requirements for crossings and protection.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.6</td>
<td>Keep records of all significant design calculations and make available for audit.</td>
<td>…………</td>
<td>...../...../......</td>
</tr>
<tr>
<td>10.7</td>
<td>Check that the</td>
<td>…………</td>
<td>...../...../......</td>
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</tbody>
</table>
design conforms to requirements of all Statutory Authorities.

<table>
<thead>
<tr>
<th>By</th>
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</table>

10.8 Check the design conforms to any development consent conditions.

<table>
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<tr>
<th>By</th>
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</table>

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.

<table>
<thead>
<tr>
<th>By</th>
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</table>

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.

<table>
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<tr>
<th>By</th>
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</table>

11.2 Check that a practicing registered Surveyor performed the survey.

<table>
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11.3 Assess geotechnical data for adequacy

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</table>
and keep records.

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<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Date</th>
<th>Signature</th>
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<tbody>
<tr>
<td>11.4</td>
<td>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.</td>
<td>…………….</td>
<td>…/…/…..</td>
</tr>
<tr>
<td>11.5</td>
<td>Document the type and class of all materials, fittings, joints, plant, pumps and special requirements for crossings and protection.</td>
<td>…………….</td>
<td>…/…/…..</td>
</tr>
<tr>
<td>11.6</td>
<td>Keep records of all significant design calculations and make available for audit.</td>
<td>…………….</td>
<td>…/…/…..</td>
</tr>
<tr>
<td>11.7</td>
<td>Check that the design conforms to requirements of all Statutory Authorities.</td>
<td>…………….</td>
<td>…/…/…..</td>
</tr>
<tr>
<td>11.8</td>
<td>Check that the design conforms to development consent conditions.</td>
<td>…………….</td>
<td>…/…/…..</td>
</tr>
</tbody>
</table>

**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.

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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: Concrete structures
- AS 4100: Steel structures
- AS 5100: Bridge design
- AS/NZS 5131: Structural steelwork - Fabrication and erection
- AS/NZS ISO 9000: Quality management systems - Fundamentals and vocabulary
- AS/NZS ISO 9001: Quality management systems - Requirements
- AS/NZS ISO 10005: Quality management systems - Guidelines for quality plans
- AS/NZS ISO 10006: Quality management systems - Guidelines for quality management in projects
- ARR: 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: Managing urban stormwater, Soils and construction (the ‘Blue Book’)
- MidCoast Council: Development Engineering Handbook
- MidCoast Council: AUS-SPEC Infrastructure Specifications
- WSA 02: Gravity Sewerage Code of Australia
- WSA 03: 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 Development Engineering Handbook. Acceptance is to be obtained in writing from:
   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.

M2. This specification applies in addition to any development consent (DA) conditions. If there is any inconsistency, the conditions of consent shall prevail.

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.

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.

6 AMENDMENT HISTORY

<table>
<thead>
<tr>
<th>Amendment</th>
<th>Date</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>30/11/2020</td>
<td>First Published</td>
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</tbody>
</table>

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