Revision 7
July 2025

A3 – Roads and Structures Design

We acknowledge the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

CITY OF SYDNEY

Contents

3.1 INTRODUCTION

The City of Sydney Streets Technical Specifications have been developed to ensure the provision of high-quality civil infrastructure compatible with the City's maintenance, asset management and serviceability requirements.

These technical specifications are output-based and specify the criteria that must be satisfied for roads and street civil assets owned by the City. Roads and streets infrastructure shall be designed by suitably qualified and experienced professionals and in compliance with these specifications and all relevant legislation, standards and current practice.

This document shall be read in conjunction with Technical Specifications B: Construction and C: Standard Drawings.

3.2 EXCEPTIONS

Departures to the requirements stipulated in the City's Sydney Streets Technical Specifications A: Roads and Structures Design, B: Construction and C: Standard Drawings are only permitted with the written approval of the City.

Departures shall be requested in writing. Failure to gain approval prior to construction may result in an order to remove, redesign or reconstruct non-compliant elements.

Written approval shall be required for each instance of non-compliance and shall include a comprehensive explanation of the following:

– description of the proposed departure.
– clauses for which departure is sought.
– justification when compliance is not possible.

Where the departure is sought during construction, justification as to why the departure was not reasonably foreseeable during the Construction Certificate or detailed design stages is also required.

3.3 CERTIFICATION

Roads and Streets shall be designed by suitably qualified and experienced professionals and certification shall be required stating that the proposed design complies with:

– City's Sydney Streets Technical Specification A3: Roads and Structures Design
– City's Sydney Streets Technical Specification B: Construction
– City's Sydney Streets Technical Specification C: Standard Drawings
– All relevant Standards/Specification/Guide/Standard Drawings that include Austroads Guide to Pavement Technology, TfNSW Specifications and Standards Drawings.

Certification is required for the design of all elements even where the City's standard drawings are used. The City's standard drawings are to be used for guidance only and the consultant must verify each of their drawings and details for the project specific requirements (e.g. geometry, loading, subgrade capacity, exposure classification) and amend them as required. At the end, the consultant needs to certify all the details and drawings that will be used in the project.

For flexible pavement design, CIRCLY software is to be used to justify the accuracy of the flexible pavement design. All pavement design considerations and CIRCLY design output are to be certified and submitted to the City.

Similarly for rigid pavement design all design considerations and design calculations are to be certified and submitted to the City. It will need to be justified how all these comply with the requirements of Austroads Guide to Pavement Technology, TfNSW Specifications and Standards Drawings.

3.4 RELEVANT STANDARDS

Roads and streets shall be designed and constructed in accordance with all relevant standards. This includes the standards listed below; however, it should be noted that the list is not exhaustive. The requirements of these Technical Specifications will prevail where the following standards are in conflict with it:

- Transport for NSW (TfNSW) Technical Directions and guidelines.
- Austroads Guide to Pavement Technology.
- Transport for NSW Specifications and Standards Drawings.

3.5 SOFTWARE

CIRCLY software is to be used to justify the accuracy of the flexible pavement design.

For rigid pavement design, relevant software used by the TfNSW and other NSW organisations (where available) is to be used to justify the accuracy of the design.

3.6 DATA REQUIREMENTS

The following information shall be required with every detailed design or Construction Certificate that includes roads and streets:

- General Plan
- Utilities Investigation Plan
- Relevant City standard drawings
- Certification of Design
- Construction Certification.

3.6.1 GENERAL PLAN

A general plan of the proposed works shall be provided at a suitable scale such as 1:200 on A3 and include the following:

- Title block, legend, north point, scale and scale bar
- Property boundaries
- Roads and road names
- Proposed development
- Existing and proposed levels, e.g. road, footpath, other topographical features, etc.
- Relevant topographical features
- Dimensions and/or coordinates accurately identifying the position of all assets without the need to scale positions off plans.

3.7 GENERAL DESIGN PRINCIPLES FOR ROAD DESIGN

Roads should be designed to:

- provide safe, short and fast thoroughfare and access to all road users (motor vehicles, cyclists and pedestrians)
- clearly convey the primary function to road users and encourage appropriate driver behaviour.
- deliver traffic volumes at speeds compatible with function.
- provide convenient location for services.
- provide an opportunity for landscaping.
- allow for parking, where appropriate
- have due regard to topography, geology, climate, environment, and heritage of the site.
- provide low cost of ownership.
- comply with these Technical Specifications and relevant Austroads and TfNSW Guidelines and/or Standards.

The appropriate design criteria for a specific road largely depend on a set of economic indicators: the costs of construction and operation on one side and financial benefits to the community on the other. These are strategic parameters that influence a decision to build a road. Economic analysis, in conjunction with traffic analysis, determine the functional class of the road and the design speed. This section must be read in conjunction with the relevant Austroads and TfNSW Guidelines and/or Standards.

3.8 GENERAL DESIGN PRINCIPLES FOR STREET DESIGN

A well-designed street requires street design coordination through planning, design detailing and implementation. Composing and considering all elements within the street is a significant contributor to the character and appearance of a place as well as providing a safe and comfortable pedestrian domain.

Good design and layout of elements:

- create a safe street.
- reinforce the street hierarchy.
- provide required paths of travel and pedestrian priority.
- provide a clear and direct composition that reinforces the major design elements.
- integrate seamlessly into the paved ground plane.
- are located consistently throughout the public domain to reflect the overall special character. This section must be read in conjunction with the Sydney Street Code.

3.9 BRIDGES AND STRUCTURES DESIGN REQUIREMENTS

Any major structure (e.g. bridge, retaining wall, public stairs/steps/ramps) and inaccessible structures (e.g. box culvert) shall have a 100-year design life and Australian Standard AS5100 is to be used in the design. Further to that appropriate concrete mix (e.g. concrete mix complying with TfNSW Specification B80) is to be used to ensure a 100-year design life. Australian Standard AS5100.5 is to be used for concrete exposure classification, concrete cover, etc.

- AS5100 – Bridge Design

– TfNSW QA Spec B80 – Concrete Work for Bridges.

Any new structure within the existing or proposed road reserve shall comply with ground clearance requirements, be designed for unrestricted vehicular load capacity, and be capable of supporting all vehicular loads in accordance with Australian Standard AS 5100.2, including SM1600 and HLP400 loading requirements.

Minor structures are to be designed as per relevant Australian Standards (e.g. AS3600, AS4100). A minimum design life of 50 years shall be achieved in the design unless specified higher by the Council. The Standards to be used include the following:

– AS3600 – Concrete Structures
– AS3735 – Concrete Structures for Retaining Liquids
– AS2870 – Residential Slabs and Footings
– AS2159 – Piling – Design and Installation
– AS4100 – Steel Structures

Steel structures and their surface coatings are to be designed to ensure a minimum of 50-year design life unless specified higher by the Council.

Design standards include the following:

– AS4100 – Steel Structures

Shotcrete is to comply with relevant TfNSW QA Specification (e.g. B82, R68):

– TfNSW QA Spec B82 – Shotcrete Work (For shotcrete work with 100-year design life, e.g. tunnels and retaining walls)
– TfNSW QA Spec R68 – Shotcrete Work without Steel Fibres (For works such as stabilising slopes in conjunction with soil nailing or rock dowelling)

Where stainless steel element is used in council works, the Grade 316 with a minimum of 100-year design life is to be used. Stainless steel items are to be appropriately isolated from carbon steel items where both types of steel are used in the same structure.

Rock bolts to be used in any cliff remediation work shall have a minimum 100-year design life.

For timber works, relevant Australian Standard and TfNSW Specifications are to be used in the design, construction and surface and preservative treatments. Only certified timber under a reputable forest certification scheme (i.e PEFC / FSA) shall be used for timber works. Design report and drawings shall clearly list all these documents to demonstrate how the most appropriate timber grade and timber treatments are used in the design and construction.

3.10 DATA HANDOVER

The supplier shall ensure that all pre-construction documentations are developed, and appropriate statutory or work authorisation approvals are obtained from relevant authorities prior to commencement of any public domain works. The documents include but not limited to following:

– Design drawings	– Arborist Assessment
– Dilapidation reports	– Inspection and Testing plans
– Construction Traffic Management Plans (CTMP)	– Conditions of Consents
– Environmental Management Plans (EMP)	– Review of Environmental Factors (REF)
– Heritage Impact Assessment	– Works approvals

Following the completion of infrastructure works, the service provider must submit the necessary documents as part of the asset handover process. The required information generally includes, but may vary depending on the nature of the project:

- Works as Executed Drawings (WAE) – A set of survey plans prepared and certified by a registered surveyor, clearly showing the works as constructed and noting all variations from the approved plans.
- Certifications of Works – A certification confirming that the works have been constructed in accordance with the approved plans, specifications, and City standards. This must be prepared by a suitably qualified professional with relevant qualifications who observed the work at each critical stage. For structural works, certification from a qualified and accredited Structural and/or Geotechnical Engineer is required.
- Inspection Records & Maintenance Documents – Includes inspection records at critical stages, onsite test results, maintenance records, manuals, and warranties for all applicable works.
- Service Authority Sign-Off – Confirmation of acceptance of works and third-party asset handover approvals from relevant service authorities.
- Stormwater Information – Includes CCTV inspections, Sydney Water S73 certificates, and other relevant documentation.
- Landscape & Street Tree Certifications – Evidence of approval by the City's Tree Management Officer and/or Parks Officer, Arborist reports etc.
- Street Lighting Certification – Includes design and installation certifications, along with acceptance from the relevant statutory authority.
- Completed Asset Datasheets – As agreed with the relevant asset owners.

Submissions must be submitted in the following formats:

- Electronic - and provided in both pdf and CAD .dwg formats. Plans must be based on Australian Height Datum (AHD) and Map Grid of Australia (MGA) orientation, zone 56. Hard copy submissions may also be requested for larger projects.
- Asset data in both spreadsheet and shape file formats. The positions shall be provided in the GDA2020, MGA2020 Zone 56 coordinate system. Each asset shall be provided with a unique label.
- Memos, reports, records, and certifications in applicable electronic format

3.11 REVISION REGISTER

Revision	Clause	Description of Revision	Authorised By	Date
Rev. 6	3.4	"Technical Directions" added to TfNSW guidelines	SA	Aug-23
	3.9	New para added "Only certified timber under a reputable forest certification scheme (i.e PEFC / FSA) shall be used for timber works"		
	Overall	References to "Roads and Maritime Services" or "RMS" changed to "Transport for NSW" or "TfNSW" respectively.		
Rev. 7	3.9	Section updated to specify any new structure within the existing or proposed road reserve shall comply with ground clearance and loading requirements	SA	Jul-25
	3.10	Section has been included to specify data handover requirement		

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