

Design Criteria for Bridges and Other Structures

Amendment Register – August 2014 to February 2018

Note: Typographical changes and commentaries are not included in this register where the requirements are not changed.

Amendments – 2017 to 2018 Reference version – March 2017	
Clause	Editing
Whole document	Director (Structural Design Standards) is amended to Director (Structures Reviews and Standards)
T4.5.1.3	Foot note 'c' was amended and new note 'd' and 'e' was added
4.6.1.2	Clause amended for all superstructure types
4.6.1.2(e)	Deleted the Item (e) and transferred under Clause 4.7.3.2
10.4.1	Amended design life of "above carriageway sign gantries"

Amendments – 2014 to 2017 Reference version – August 2014	
Clause	Editing
	Added Scope of this Document
	Added Table of Definitions
	Added Table of Referenced Documents
Whole document	Most of technical issues related to Transport and Main Roads Acceptance were changed from DCE(Structures) to Director (Structural Design Standards)
1	Scope for bridge design criteria expanded for overpasses, underpasses, busway bridges and light rail bridges
1.2.3	Arch bridges added
1.2.4(a)	Added integral bridges may consider to expand span capability. Added the requirements of additional cast-in ferrules for reinforcement starter bars
1.2.4(b)	Added additional requirements for small blade wall bridge supports and commentary
1.2.5	Added requirement for access for people with disabilities to public transport
1.3	Added new clause for Bridge width limitations for maintenance and inspection (subsequent clauses 1.3 - 1.9 renumbered 1.4 - 1.10)
1.4.3.a	Added cross reference to Drafting Manual for survey information
1.4.3.j	Requirement of condition assessment for existing transverse stressing bars
1.4.4	Changed minimum gap for access from 1.2 to 2.0 m
1.4.5.2	Title changed from " operations residual life" to "structural residual life"
1.4.6.2	Added reference to MRTS96
1.6.1(e)	Added sub-clause for multiple bridge design reports
1.6.2	Added consideration for jacking for bearing such as minimum number of bearings and separate superstructure

Amendments – 2014 to 2017 Reference version – August 2014	
Clause	Editing
1.9	Remove the title and content and added new title and reference to MRTS50 and Drafting Manual
3.1.2.4(b)	Footbridge clearance requirement was amended
3.2.3	Deleted “Culvert” from the title
T 3.2.3.1	Table amended. 79.5 t crane was added. 48 t crane at crawl on centreline was deleted
3.2.8	Added new clause for design traffic loads for busway bridges
3.2.9	Added new clause for design traffic loads for light rail bridges
3.4	Added a commentary
3.4.1	Option 1 was amended
3.4.2	Minimum stream velocity for hydraulic force increased to 2.0 m/s Added cross reference to blockage requirements Added item c)
3.8.1	Added vent holes to be detailed on the drawings
3.8.2(a)	Added stainless steel grade
3.8.3.3(a)	Clause amended and added commentary for clarification that welded joints preferred for painted steel structures
3.8.3.3(g)	Hollow section welding requirement was added
T3.8.4.1(a)	Note 2 was amended to replace “HAT” from “Wave crest level”
T3.8.4.1(b)	Note 1 was amended and added exposure class C2 exceptions for piles
3.8.4.1(e)	Delete “below HAT” and added “above HAT”
3.8.4.3	Amended the title
3.8.4.3(b)	Amended the chloride content for RC and PSC
3.10.1(c)	Added reference to Clause 4.1.6 for use of steel piles
3.10.3	Changed clause title Chloride content corrected to 8000 ppm C2 exposure classification requirements noted Stainless steel requirements clarified
3.13.3	Method of construction to be described in the design documentations
3.14	New Clause was added for Acceptable level of Afflux and content transferred from previous Clause 3.12.1
3.15.1	Whole clause was amended and commentary added
3.16.2	The clause (previously 3.13.2) was amended
3.18	Added commentary
4.1.1(b)	Specified “35MPa concrete strength at transfer” and commentary added
4.1.2(e)	Added new clause for steel liners as temporary formwork
4.1.6	Added clause for Steel piles
4.1.7	Added clause for Raked piles
4.3	Added clarification on delays and innovation in last paragraph

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Clause	Editing
4.5.1.2.b	Added, platform at abutment, provision of drain covers, fixed ladders, safety harness and handrails Added, no access to inspection platform from road under the bridge
4.5.1.2.c	Eyelet size was added (previous version specified this in Clause 3.13.2)
4.5.1.3	Added cross reference to “Bridge Scour Manual” and Table 4.5.1.3 for Abutment Protection Type Selection
4.5.1.3.2.b	Added abutment protection length and toe requirements
4.5.1.4.b	Added “where significant settlement was expected” text and cross reference to raked pile requirements
4.6.2(a)	Added the requirement of jacking procedure
4.6.2(g)	Added sub clause for stress limits when jacking continuous or integral deck
4.6.5	Details of hog values and elastic modules to be shown in the drawings
4.7.1(a)	Clause amended for requirement of RC shear blocks with vertical dowels
4.7.1(b)	Added positive hold down connection and commentary
4.7.3.1(a)	Added clarification of PSC deck unit end length
4.7.3.1(f) OLD	Clause 4.7.3.1(f) of previous version for maximum pretension force in a tendon at transfer was removed from the design criteria.
4.7.3.4	Added commentary
4.7.4.1	Added commentary
4.7.4.2 (OLD)	Clause 4.7.4.2 of previous version for maximum pretension force in a tendon at transfer was removed from the design criteria.
4.7.5.5.1	Amended to include load combinations
4.7.5.5	Added load combinations in AS 3610, Table 4.5.1
4.7.5.6	Added commentary
4.7.5.8 (OLD)	Clause 4.7.5.8 of previous version for maximum pretension force in a tendon at transfer was removed from the design criteria
4.7.6.5 (OLD)	Clause 4.7.6.5 of previous version was deleted
4.7.8.2	Added design criteria for steel box girders
4.7.8.6 (OLD)	Clause 4.7.8.6 of previous version was removed from the Design Criteria
4.8.3	Deleted reference to MRTS31 Added reference to MRTS84 <i>Deck Wearing Surface</i> Added sub clause (g) and figures detailing DWS profiles. Minimum asphalt thicknesses for design purposes modified to suit the current MRTS30
4.9.1	Added reference to Road Planning and Design Manual (RPDM) for barrier requirements for other structures (non-bridge)
4.9.1.2(b)	Changed frangible attachments section thickness from 3 mm to 5 mm
4.9.1.8	Title amended and commentary added
4.9.2	Amended to say that wire rope barriers shall not be used on bridges
4.9.3(c)	New clause added the provision for anti-jump screen on bridges/structures
4.9.4	New clause added for criteria for barrier between footpath/cycle path and carriageway

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4.9.5	New clause added for criteria to protect existing bridge supports
4.10.1	Clause numbering order was changed
4.13.2	Added SS grade 316 Added, not encasing services attached to bridge deck Added, gas pipes shall be located in well ventilated open areas of the bridge Added, light post junction box location on the bridge decks
5	Title changed to “Additional requirements-bridges” Previous Clause 5.1 was removed Previous Clause 5.3 was removed Previous Clause 5.4.1 was removed
Ch6 Part 1 CI 10.6.3	Changed frangible attachment section thickness from 3 mm to 5 mm
Ch6 Part 2 CI 10.2	Added Clause 4.9.5 for existing bridge support protections Remove “Other Structures” Transfer RSS wall protection requirements to Clause 13.8 Added Thrie beam to the list of barrier types not acceptable for bridge support protection Added criteria for minimum length of protection barrier beyond structure
Ch6 Part 5 Table 6.3.1	Added “AS 4672.1 – 7 wire – 15.2 – 1830 – Relax 2” to the list
Ch7, Item 3	Item 3 - Changed, non-linear analysis permissible subject to the department’s prior approvals
Ch7, Item 15	Added reference to Clause 3.1.2.4
Ch7, Item 25	Changed cross reference to bridge supports – now contained in document
Ch7, Item 42	Added reference to Clause 3.2.9 for light rail bridges
CH 7, Item 54	Amended, Classification III bridges list to include bridges with tall piers (>20 m)
Ch7, Item 58	Added reference to “Geotechnical Design Standards - Minimum Requirements” Item 58 and other relevant items
Ch8	Chapter 8 was reorganised - the specific changes to Chapter 8 are listed below
8.1.3	Added additional references
8.1.4.2	Added commentary
8.3	Reduced wall panel from 40 years to 25 years Added design life for load bearing and non-load bearing walls
8.4(e)	Changed cover requirements for shotcrete
8.4(f)	Added, refer Clause 8.8.3.2 for limitations in the use of shotcrete concrete
8.4(k)	Added, blockwork infill grout requirements for 50 year and 100 year design lift blockwalls
8.6	Added new clause for tunnel hydraulics and drainage Changed tunnel flood immunity freeboard increased from 300 to 600 mm where affected by climate change. Reference to the department’s Storm Tide design guidelines added.
8.7(a)	Added safety criteria for human exposure to fire
8.8.1(b)	Added clarification on tunnel water pressure design requirements
8.8.1(i)	Added alternative waterproofing methods where drainage cannot be installed behind tunnel lining
8.8.2(b)	Added clarification of working width requirements

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8.8.3.1	Added the requirements for TBM segmental lining
8.8.3.2	Added the requirements for two passing lining system Added commentary for definitions of tunnel lining types
8.8.3.2	Added, unreinforced concrete secondary lining is permitted subject to conditions
8.8.4(f)	Added contiguous piles to be minimum 600 mm diameter
8.8.4(g)	Added drainage layer requirement behind the walls
8.14.1(e)	Added text that any groundwater change subject to EIS
8.14.4	Whole clause was re-written
8.15	Content was removed and reference added to MRTS50 and Drafting Manual
Ch9	Development application in the proximity to tunnel requirements has been overhauled and largely re-written
10.1	Added reference to MRTS92 and MRTS97
T10.4.6(a)	Vertical deflection amended to include “sag”
T10.4.6(b)	Vertical deflection amended to include “sag”
10.4.8(d)	Added baseplate location requirements
10.4.8.2	Added sentence to “Foundation types not permitted” to clarify where clause applies
10.6.1	Added commentary. Platform shall be free from sharp corners and projections
10.6.2	Add clarification for access ladder and landings for new constructions. Table 10.6.2 (a) updated
10.9	Hollow section welding requirement was added
11.4.5.3	Added 20 years ARI for SLS wind speed
11.4.5.6	Added a statement “Drilling and coring into prestressed concrete members is not permitted”
11.4.5.8	Amended serviceability deflection criteria similar to gantry structures and added T11.4.8(a) and (b)
11.4.5.10.2	Clause amended and added requirements for use of listed pile types that are not permitted
11.4.8(e)	Change the gap from 100 mm to 50 mm for no mesh
11.4.9	Add clarification for access ladder and landings for new constructions. Table 11.4.9 (a) updated
11.4.12	Added cross reference to gantry structures for protection from impact
11.4.17(d)	Added hollow section welding requirement
11.5.3.3	Added 20 years ARI for SLS wind speed
11.5.11(b)	Added hollow section welding requirement
11.6	Added Clause for provision of fall protection to existing advertising signs
Ch12	Amended the scope statement for Arch design criteria and title changed to include “Buried arches”
12.3	Whole clause was re-written. Added clarification of the RPEQ certification requirements and documents to be submitted
12.4	Clause was re-written and rearranged

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Clause	Editing
12.7	Added arch design requirement for development adjacent to arches
13	Added reinforced masonry walls
13.2	Added durability requirements for reinforced masonry
13.3.1(e)	Amended the minimum shotcrete thickness to 160 mm and cover requirements
13.8.1(a)	Added the requirement of proving sufficient redundancy if sufficient RSS protection is not provided
13.8.1(c)	Added the protection requirement where RSS is outside the 10 m clear zone
13.9.2	Added shotcrete durability requirements and increased thickness from 150 mm to 160 mm to meet cover requirements
13.10	Added the additional requirements of block masonry
14.3(a)	Added design and construction of busway structures to project specific specifications
14.3(b)	Added busway buildings and light rail stations design requirements for people with disabilities
14.3.2	Amended clause for foundation types not permitted
16.7.6	Deleted Ductility requirements Added deformability requirements
16.7.8	Fire Resistance requirement changed to be only if instructed
17	Amended the scope of small drainage structures section
17.1	Added the various culvert design standards and reference to RDM
17.2	Amended the drainage pit design life and headwall design life
17.3	Added for barrier requirements for culvert structures
17.4	Added the approach treatment requirements for large culverts
18.2	Added the reference standard drawings
19	Added list of published departmental Technical Notes