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Bridge Specific Design Criteria (BSDC)

Road and Pedestrian Bridges

To be completed with reference to the **Standard Bridge Design Criteria (SBDC)**

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Amendments

Revision Number	Revision Date	Description of Key Changes	Section / Page No.

1 MATERIAL PROPERTIES

Friction coefficient (for post-tensioning)	AS 5100.5 CI 3.4.2.4
Wobble coefficient (for post-tensioning)	AS 5100.5 Cl 3.4.2.4
Draw-in loss (for post-tensioning)	Supplier information
Initial jacking stress for strands (% f_{pb})	
Characteristic compressive strength at prestress transfer (MPa)	
Additional specific material design parameters, if any	

2 TRAFFIC LOADS

Road Traffic		
Number of standard design lanes	AS 5	100.2:2017 CI 7.5
Centrifugal forces, <i>F</i> _c (kN)	AS 5	100.2:2017 CI 7.8.1
Braking forces, F_{BS} and F_{BM} (kN)	AS 5	100.2:2017 CI 7.8.2
No. of design lanes for F_{BM}	AS 5	100.2:2017 CI 7.8.2
Pedestrian/cyclist path load (kPa)	AS 5	100.2:2017 CI 8.1
Fatigue load effects	AS 5	100.2:2017 CI 7.9
Year bridge is to be put into service		
No. of heavy vehicles per lane per day	AS 5	100.2:2017 CI 7.9
Route factor	AS 5	100.2:2017 CI 7.9
Number of fatigue stress cycles for A160 and M1600	AS 5	100.2:2017 CI 7.9
Pedestrian/cyclist path load (kPa)	AS 5	100.2:2017 CI 8.1
Service live load on walkways of road sign structures (kPa)	AS 5	100.2:2017 CI 8.2

3 COLLISION LOADS

Collision from waterway traffic Specify type and weight of vessel; speed	AS 5100.2:2017 CI 11.6 SEDM Section 4.5
of impact	

4 BARRIER LOADS

Traffic barrier performance level (PL) (ADT is at first year after construction)	AADT				AS 5100.1:2017 App. A
	RT	GD	CU	US	
	Require	ed PL (A	S5100.1		
	Provide	ed PL			
Pedestrian and cyclist barrier load (i.e., Specify standard or crowd loading)				AS 5100.2:2017 CI 12.5	

5 SOIL AND SETTLEMENT LOADS

Soil unit weight, γ (kNm ⁻³)	
Soil internal friction angle, ϕ (°)	
Water table level (m) RL	
Compaction pressures (kPa) dependant on compaction equipment	AS 4678:2002 App. J
Construction loads (surcharge; kPa) dependant on construction equipment	AS 5100.3:2017 CI 3.2.3 AS 4678:2022 App. J
Differential settlement (mm) at piers and abutments, if differing from SBDC	AS 5100.2:2017 CI 20 MRWA SEDM CI 19
Horizontal earth pressure coefficient allowing for strain ratcheting effects	PD 6694-1:2011 Cl 9.4.2

6 EARTHQUAKE LOADS

Bridge earthquake design category	1		AS 5100.2:2017 CI 15.4
Design performance level			AS 5100.2:2017 CI 15.5
Site subsoil class			AS 1170.4:2007 Sect 4
Design ductility factor µ	Longitudinal	Transverse	AS 5100.2:2017 CI 15.9

7 WATER FLOW LOADS

ARI for SLS			AS 5100.2:2017 CI 16.3
 Velocity, V (ms⁻¹) a) For substructures b) For superstructures and debris loading c) For log and vessel impact 	SLS	ULS	AS 5100.2:2017 Cl 16.2 (a)-(c)
Minimum freeboard at SLS (m)			
Scour (m)	SLS	ULS	

8 WIND LOADS ON BRIDGES

Wind Region				AS 1170.2:2021 Fig 3.1(A)	
Wind speed multipliers	M _{z,cat}	M _d	Ms	M _t	AS1170.2:2021 Sects 3.3, 3.4, 4.2 - 4.4
Design wind speed, <i>V</i> (ms ⁻¹) (<i>SLS; ULS</i>)					AS 5100.2:2017 CI 17.2.1

9 WIND LOADS ON ROAD SIGNS AND LIGHTING STRUCTURES

ARI for ULS					AS 5100.2:2017 CI 24.2
Wind speed multipliers	M _{z,cat}	M _d	Ms	M _t	AS1170.2:2021
					Sect 3.3, 3.4, 4.2 to 4.4
Design wind speed, <i>V</i> (ms ⁻¹) (<i>SLS; ULS</i>)					AS 5100.2:2017 CI 24
Aerodynamic shape factor, C _{shp}					AS 1170.2:2021 CI 5
Dynamic response factor, C _{dyn}					AS 1170.2:2021 CI 6
Fatigue wind speed (ms ⁻¹)					AS 5100.2:2017 CI 24.4

10 WIND LOADS ON NOISE BARRIERS AND PROTECTION SCREENS

ARI for ULS					AS 5100.2:2017 CI 25.3.2
Wind speed multipliers	M _{z,cat}	M _d	Ms	Mt	AS1170.2:2021 Sect 3.3, 3.4, 4.2 to 4.4
Aerodynamic shape factor, C _{shp}			·	·	AS 1170.2:2021 CI 5
Dynamic response factor C _{dyn}					AS 1170.2:2021 CI 6

11 THERMAL LOADS

Max. avg. bridge temperature (°C)			AS 5100.2:2017 CI 18.2
Min. avg. bridge temperature (°C)			AS 5100.2:2017 CI 18.2
Construction temperature range (°C)			
Positive temperature variation (°C)			-
Negative temperature variation (°C)			-
Differential temperature Specify bridge type and T (°C)	Туре	Τ	AS 5100.2:2017 Clause 18.3

12 CONSTRUCTION LOADS

Live load, if differing from SBDC	BBDIM Section 9
ARI for wind load during construction	AS 5100.2:2017 CI 22.2
Differential settlement and construction tolerance allowances between bearing levels (mm)	BBDIM Section 9
Temporary walkway load (kPa)	AS 1657:2018

13 DESIGN SERVICEABILITY REQUIREMENTS

Material Stresses for crack control	
Prestressed concrete beams – criterion adopted for crack control – <i>specify clause 8.6.2.1 (a) or (b)</i>	AS 5100.2:2017 CI 8.6.2.1
Road Bridges - Vibration	
First mode flexural frequency (Hz)	AS 5100.2:2017 CI 13.2.1
Pedestrian Bridges - Vibration	
Fundamental freq. of vertical vibration (f_0) (Hz)	AS 5100.2:2017 CI 13.4.1
Maximum vertical acceleration (of bridge) (ms ⁻²)	For simply supported bridges as per Cl 13.4.2 of AS 5100.2:2017
Fundamental frequency of horizontal vibration (Hz)	See Cl 13.4.1 of AS 5100.2:2017
Specialist literature list if any used	