Master Specification
Part RD-PV-D3

Concrete Road Pavements

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RD-PV-D3 Concrete Road Pavements

1 General

a) This Master Specification Part sets out the requirements for the design and construction of concrete road pavements, including:

i) the documentation requirements, as set out in section 2;

ii) the general requirements, as set out in section 3;

iii) the interpretation of the TfNSW specifications, as set out in section 4;

iv) the Tunnel pavement requirements, as set out in section 5; and

v) the pavement maintenance diary requirements, as set out in section 6.

b) Concrete road pavements must be designed and constructed to meet the requirements of the Reference Documents, including:

i) AGPT Part 2: Pavement Structural Design;

ii) AS 1289 Methods of testing soils for engineering purposes;

iii) TfNSW Specification TS 03267.2 Plant Mixed Heavily Bound Pavement Course - DC (IC-DC-R73 Ed 2/ Rev 3) (available from: https://standards.transport.nsw.gov.au/search-standard/);

iv) TfNSW Specification TS 03269.2 No Fines Concrete Subbase - DC (IC-DC-R81 Ed 2/ Rev 2) (available from: https://standards.transport.nsw.gov.au/search-standard/);

v) TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase - DC (IC-DC-R82 Ed 2/ Rev 4) (available from: https://standards.transport.nsw.gov.au/search-standard/);

vi) TfNSW Specification TS 03271.2 Concrete Pavement Base - DC (IC-DC-R83 Ed 2/ Rev 4) (available from: https://standards.transport.nsw.gov.au/search-standard/);

vii) TfNSW Specification TS 03273.2 Diamond Grinding of Concrete Pavement - DC (IC-DC-R93 Ed 1/ Rev 1) (available from: https://standards.transport.nsw.gov.au/search-standard/);

viii) TfNSW Specification TS 06306.2 Low Noise Diamond Grinding of Concrete Pavement - DC (IC-DC-R94 Ed 1/ Rev 1) (available from: https://standards.transport.nsw.gov.au/search-standard/);

ix) TfNSW Test Method T189 Determination of Skid Resistance by Sideways Force Measuring Equipment;

x) TfNSW Test Method T379 Cleanliness of Sawn Concrete Pavement Joints; and

xi) the relevant TfNSW Standard Drawings - Pavement referenced in 1b)iii) to 1b)viii) (available from: https://standards.transport.nsw.gov.au/search-standard/).

c) The design and construction of concrete road pavements must comply with RD-PV-D1 “Pavement Investigation and Design”, to the extent specified in section 3.

2 Documentation

2.1 Design Documentation

In addition to the requirements of PC-EDM1 “Design Management”, the Design Documentation must include:

a) a Concrete Pavement Design Report which:

i) documents the pavement Design Basis, Site investigation, all inputs and calculations or methodology, detailed pavement configurations and their use on the Project;

ii) includes documentation with sufficient detail to allow verification of conformance with the Contract Documents including:

A. the Project scope;

B. references to design standards used;

C. basis of selection of each pavement type, including surfacing type;

D. subgrade support conditions, including:

I. the results of Site investigations with geotechnical field and laboratory test data;

II. considerations of any earthworks and stabilisation treatments, the sequence of such works and the use of select fill;

III. considerations of moisture changes during the life of the pavement, the depth of the water table and provision of subsurface drainage;

IV. the basis and nomination of subgrade design CBR value; and

V. uneven support conditions that may occur over large underground services, culverts or at the transition of the cut and fill zones;

E. identification of any subgrade issues or risks affecting pavement design, construction and performance including:

I. expansive soils;

II. groundwater ingress or infiltration;

III. inadequate drainage;

IV. weak subgrades;

V. fill / uncontrolled fill;

VI. total and differential settlement;

VII. collapsing soils;

VIII. organic soils;

IX. rock; and

X. appropriate subgrade treatments;

iii) the design accounts for existing data, including construction data, pavement condition data, pavement history and previous pavement reports (if available);

iv) assessment of adjacent existing pavements, including their shape and defects, and the need to address these to achieve acceptable road geometry and pavement roughness, and the Design Life from the new Works;

v) detailed design calculations and methodology, including:

A. pavement Design Life;

B. Project reliability factor;

C. nominated design moduli for each pavement material and basis of selection, including asphalt design speed;

D. the performance relationships used to estimate allowable loadings;

E. design traffic calculations, including data sources and the basis of selection of each input parameter. Note any freight/haul routes or other seasonal or unusual traffic movements. State adopted values as applicable for traffic counts (AADT, HV count (%)), growth rates, traffic load distribution (ESA/HVAG) and lane distribution factor. Cumulative design traffic loadings must be stated for all considered Design Life;

F. technical basis of the selected design traffic loading of short term heavy loadings as required by section 4.2.2c) of RD-PV-D1 “Pavement Investigation and Design”;

G. thickness design calculations, being, where relevant:

I. Austroads Rigid Pavement Design Procedure, as specified in AGPT Part 2: Pavement Structural Design;

II. Mincad CIRCLY Job Summary File (or AustPADs equivalents), with layer thicknesses, elastic properties, critical strains and allowable loadings or cumulative damage factors, where applicable; or

III. other pavement design procedures used in design; and

H. rounding up and adjustment of the critical layer thickness;

vi) assumptions, design benefits and limitations must be reported, as well as the preferred design option, construction issues and risks;

vii) identify any potential interface issues such as drainage or road design;

viii) a neat summary of each pavement configuration;

ix) a pavement work schedule for each pavement type;

x) identifies sustainability in design requirements, in accordance with PC-ST1 “Sustainability in Design”;

xi) identify the source of traffic data applied and calculations for each pavement design, as required by section 4.2.1a) of RD-PV-D1 “Pavement Investigation and Design”;

xii) evidence of consideration of the whole of life cost benefits of constructing the perpetual pavement thickness in accordance with section 4.3.2 of RD-PV-D1 “Pavement Investigation and Design”;

xiii) turn count data as required by section 4.3.4b)ii of RD-PV-D1 “Pavement Investigation and Design”; and

xiv) scope of site investigations and results of such site investigations, as required by section 5.1e) of RD-PV-D1 “Pavement Investigation and Design”;

b) pavement Design Drawings, which:

i) include sufficient information on pavement types, extents, joint and other design details, with related notes, as necessary to present the pavement designs for tendering and construction; and

ii) must be prepared in accordance with Department Drawing Presentation RD2.1 Example Drawings for Large Project, and Department Drawing Presentation RD2.2 Example Drawings for Small Project (as applicable) and TfNSW Standard Drawings (as applicable) and include:

A. pavement treatment plans, showing the extent of each pavement type;

B. pavement joint details and reinforcement, for each combination of intersecting pavement types;

C. pavement work schedules;

D. provision of pavement depths on cross-sections where significant changes in road geometry are occurring as part of the Works (e.g. rural projects with widenings and rehabilitation of existing pavements incorporating overlays or inlays); and

E. any other drawings and details necessary to document the design and avoid uncertainty during tender and construction, such as construction notes, typical cross-sections, edge and interface details;

c) a separate pavement maintenance diary as identified in section 6b) for each pavement type; and

d) the criteria adopted to develop the pavement maintenance diaries.

2.2 Construction Documentation

In addition to the requirements of PC-CN3 “Construction Management”, the Construction Documentation must include:

a) a suitable installation methodology for traffic detector loops as required by section 5.1e);

b) a Concrete Road Pavement Construction Management Plan which must include:

i) all matters relating to construction of the concrete road pavement; and

ii) all matters set out in those TfNSW specifications referenced in section 1b) as requirements for the “Project Quality Plan”; and

c) the items required to be submitted as part of the Construction Documentation as set out in section 4.

2.3 Maintenance Plan

In addition to the requirements of PC-CN2 “Asset Handover”, the Maintenance Plan must include the pavement maintenance diaries required by section 6b).

2.4 Quality Management Records

In addition to the requirements of PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable), the Quality Management Records must include the items required to be submitted as part of the Quality Management Records as set out in section 4.

3 General requirements

a) Concrete road pavements must be designed and constructed in accordance with the TfNSW specifications referenced in section 1b), as modified by section 4.

b) In addition to the requirements of the TfNSW specifications, concrete road pavements must comply with the requirements set out in this Master Specification Part.

c) The locations where TfNSW Specification TS 03273.2 Diamond Grinding of Concrete Pavement - DC (IC-DC-R93 Ed 1/ Rev 1) should be applied compared to TfNSW Specification TS 06306.2 Low Noise Diamond Grinding of Concrete Pavement - DC (IC-DC-R94 Ed 1/ Rev 1) will be detailed in the Contract Documents.

d) The following sections of RD-PV-D1 “Pavement Investigation and Design” apply to the design of concrete road pavements:

i) section 4 (design traffic): with Table RD-PV-D1 4-1 of RD-PV-D1 “Pavement Investigation and Design” replaced with Table RD-PV-D3 3-1;

Table RD-PV-D3 3-1 Pavement Design Life periods for new and rehabilitated concrete road pavements

Road classification	Concrete road pavements, Design Life (years)	
	New	Rehabilitation
Motorway - main alignment and ramps	40	40
Urban and rural arterial, urban and rural connector	40	40
Access	40	40

ii) section 4.2.2: add:

A. the design of short-term loadings from construction vehicles must be considered and allowed for in the design of Tunnel pavements;

iii) section 5.1 (Site investigation, General);

iv) section 5.2 (Site investigation, Intrusive Site investigation);

v) section 5.3 (Site investigation, Site inspection and pavement condition survey);

vi) section 5.5.5 (Site investigation, Pavement condition data, Cracking);

vii) section 5.5.6 (Site investigation, Pavement condition data, Surface deflection of flexible pavements): with the title of this subsection renamed as “Surface deflection of rigid pavements”; and

viii) section 6 (Subgrade): with:

A. section 6.2.2a) replaced with the following requirement: “The Contractor must determine the vertical design modulus of a subgrade from its design CBR, equation 2 and equation 55 of AGPT Part 2: Pavement Structure Design. Maximum vertical modulus of 150MPa must apply to Tunnel subgrades”;

B. section 6.3a) replaced with the following: “provide a working platform on which to place pavement layers, particularly over soft subgrades”; and

C. section 6.3c) removed.

4 Interpretation of TfNSW specifications

a) The requirements of the TfNSW specifications referenced in section 1b) must be read as if modified by Table RD-PV-D3 4-1.

b) In addition to section 4a):

i) TfNSW Specification TS 03267.2 Plant Mixed Heavily Bound Pavement Course - DC (IC-DC-R73 Ed 2/ Rev 3) which must be read as if modified by Table RD-PV-D3 4-2.

ii) TfNSW Specification TS 03269.2 No Fines Concrete Subbase - DC (IC-DC-R81 Ed 2/ Rev 2) which must be read as if modified by Table RD-PV-D3 4-3;

iii) TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase (IC-DC-R82 Ed 2/ Rev 4) must be read as if modified by Table RD-PV-D3 4-4;

iv) TfNSW Specification TS 03271.2 Concrete Pavement Base - DC (IC-DC-R83 Ed 2/ Rev 4) must be read as if modified by Table RD-PV-D3 4-5;

v) TfNSW Specification TS 03273.2 Diamond Grinding of Concrete Pavement - DC (IC-DC-R93 Ed 1/ Rev 1) must be read as if modified by Table RD-PV-D3 4-6; and

vi) TfNSW Specification TS 06306.2 Low Noise Diamond Grinding of Concrete Pavement - DC (IC-DC-R94 Ed 1/ Rev 1) must be read as if modified by Table RD-PV-D3 4-7.

Table RD-PV-D3 4-1 General interpretation of TfNSW specifications

Term used in TfNSW specifications	Interpretation for the purposes of this Master Specification Part
Design Documentation	All references to Design Documentation must be read as references to Design Documentation as defined in PC-IN2 “Glossary of Terms”.
Identified Records	All references to the Identified Records must be read as references to the Quality Management Records.
Lot	All references to a Lot must be read as a reference to a Work Lot.
Nominated Authority	All references to the Nominated Authority must be read as a reference to the Principal.
Nonconformity	All references to a nonconformity must be read as a reference to a Non-Conformance.
Project Quality Plan	All references to the Project Quality Plan must be read as references to the Concrete Road Pavement Construction Management Plan required by section 2.2b), which forms part of the Construction Documentation.
Project Verifier	All references to the Project Verifier must be read as a reference to the Principal.
Specification TfNSW D&C Q6	With the exception of clause 8.3.3 of TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase (IC-DC-R82 Ed 2/ Rev 4), all references to Specification TfNSW D&C Q6 must be read as a reference to PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Testing	All testing must be included as part of the Quality Management Records.
Works	All references to Works must be read as a reference to Works and Temporary Works.

Table RD-PV-D3 4-2 Interpretation of TfNSW Specification TS 03267.2 R73 Plant Mixed Heavily Bound Pavement Course

Item	Amendment
Clause 1.2.5 (Frequency of Testing)	Where frequency of testing is not specified, the Contractor must nominate that frequency as part of the Construction Documentation.
Clause 2.3 (Certified Stockpiles) Hold Point	The Hold Point in clause 2.3 must be read as a documentation Hold Point, with a review period of 2 Business Days. Must provide test certificates verifying the conformity of all such additional material as part of the Quality Management Records.
Clause 3.3 (Retarders)	Provide details of retarders supported by NATA endorsed test certificates required by clause 3.3 as part of the Construction Documentation.
Clause 4.2 (Submission of Contractor Nominated Mix Design) Hold Point	The Hold Point in clause 4.2 must be read as a documentation Hold Point, with a review period of 10 Business Days.
Clause 5.2 (Blending of MTBB from Constituent Components) Hold Point	The Hold Point in clause 5.2 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 5.3 (Process Control)	Submit the results at the end of each days production required by clause 5.3 as Quality Management Records.
Clause 6.3.3 (Submission of Proposal for placement in 2 layers) Hold Point	The Hold Point in clause 6.3.3 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 6.6.1 (Joints) Hold Point	The Hold Point in clause 6.6.1 must be read as a documentation Hold Point, with a review period of 2 Business Days.

Item	Amendment
Clause 6.9.1 (Trial Pavement) Witness Point	The Witness Point in clause 5.1 must be read as a construction quality Witness Point, with 3 days notification. The Hold Point in clause 6.3.3 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 6.9.2 (Nonconformities)	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause as part of any Non-Conformance Report.
Clause 6.11 (Bituminous Seal) Hold Point	The Hold Point in clause 6.11 must be read as a construction quality Hold Point, with a notification period of 6 Business Days.
Clause 7.2.1 (Requirements where finished surface level are specified) Hold Point	The Hold Point in clause 7.2.1 must be read as a construction quality Hold Point, with a notification period of 7 Business Days.
Clause 7.2.3 (Requirements where finished surface level are not specified)	Submit the schedule of levels required by clause 7.2.3 as part of the Quality Management Records.
Clause 7.3 (Survey for bound pavement course finished surface levels)	Submit the schedule of the bound pavement curse finished levels required by clause 7.3 as part of the Quality Management Records. Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause as part of any Non-Conformance Report.
Clause 8.4.2 (Maximum Wet density)	Provide records of the time and commencement of mixing of the material at the sampling location and the time of sampling required by clause 8.4.2 as part of the Quality Management Records
Clause 8.4.3 (Relative compaction)	Provide records of test location, relative compaction results for pavement depth at each location and characteristic value of relative compaction of each lot required by clause 8.4.3 as part of the Quality Management Records.
Clause 8.10 Certificate of competency)	Provide a signed certificate verifying conformity with the requirements and a summary of the test results as part of the Quality Management Records. Provide daily the moisture content and relative density test results as part of the Quality Management Records. Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause as part of any Non-Conformance Report.
Clause 8.11(Treatment of Nonconforming lots)	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause as part of any Non-Conformance Report.

Table RD-PV-D3 4-3 Interpretation of TfNSW Specification TS 03269.2 R81 No Fines Concrete Subbase

Item	Amendment
Clause 1.2.5 (Frequency of Testing)	Where frequency of testing is not specified, the Contractor must nominate that frequency as part of the Construction Documentation.

Item	Amendment
Clause 3.7.1 (Submission of nominated mixes, General)	The final paragraph of clause 3.7.1 is deleted. The Contractor may not propose a mix listed in the TfNSW Register of Concrete Mixes as conforming to TfNSW Specification TS 03269.2 R81 No Fines Concrete Subbase. The Hold Point in clause 3.7.1 must be read as a documentation Hold Point, with a review period of 5 Business Days. The Hold Point in clause 3.7.1 must be read as deleting the option for the Contractor to submit details of listed in the TfNSW Register of Concrete Mixes as conforming to TfNSW Specification TS 03269.2 R81 No Fines Concrete Subbase.
Clause 4.2.3 (Production Monitoring, Batching Record)	The Batching Records required by clause 4.2.3 must be included as part of the Quality Management Records.
Clause 4.3.6 (Discharge) Hold Point	The Hold Point in clause 4.3.6 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 4.6.2 (Forming Time, Actual Forming Time)	Record the specific location of the load placed in the works required by clause 4.6.2 to be provided as part of the Quality Management Records
Clause 5.1 (No Fines Concrete Subbase Paving) Hold Point	The Hold Point in clause 5.1 must be read as a construction quality Hold Point, with a notification period of 1 Business Days.
Clause 5.11.1 (Concrete Paving Trial, General) Hold Point	The Hold Point in clause 5.11.1 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 5.14.1 (Trafficking of NFC Subbase and Asphalt Interlayer, Trafficking of NFC Subbase) Hold Point	The Hold Point in clause 5.14.1 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 5.14.2 (Trafficking of NFC Subbase and Asphalt Interlayer, Trafficking of Asphalt Interlayer) Hold Point	The Hold Point in clause 5.14.2 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 6.1.2 (Survey, Levels, Survey Prior to NFC Subbase Paving)	The Survey Report in clause 6.1.2 must be submitted as part of the Quality Management Reports prior to NFC subbase paving and upon completion of placing dental concrete.
Clause 6.1.3 (Survey, Levels, Survey Prior Asphalt Interlayer and Base Paving)	The schedule of levels in clause 6.1.3 must be submitted as part of the Quality Management Records.
Clause 7.3.2 (Subbase Alignment Levels and Surface Profile, NFC Subbase and Asphalt Interlayer Surface Levels) Hold Point	The Hold Point in clause 7.3.2 must be read as a construction quality Hold Point, with a notification period of 5 Business Days.
Clause 7.4 (Redesign of Pavement levels)	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause 8.8.2 as part of any Non-Conformance Report.

Item	Amendment
Clause 7.6.2 (Sawcutting)	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause 8.8.2 as part of any Non-Conformance Report.

Table RD-PV-D3 4-4 Interpretation of TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase (IC-DC-R82 Ed 2/ Rev 4)

Item	Amendment
Clause 1.2.5 (Frequency of Testing)	Where frequency of testing is not specified, the Contractor must nominate that frequency as part of the Construction Documentation.
Clause 2.9.2 (Curing Compounds, Acceptance Testings)	Written certification and relevant test results required by clause 2.9.2 for each nominated compound must be provided as part of the Construction Documentation.
Clause 3.7 (Trial Mixing for Mix Design) Witness Point	The Witness Point in clause 3.7 must be read as a construction quality Witness Point, with 2 days notification.
Clause 3.8.1 (Submission of Nominated Mixes, General) Hold Point	a) The final paragraph of clause 3.8.1 is deleted. The Contractor may not propose a mix listed in the TfNSW Register of Concrete Mixes as conforming to TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase. b) The Hold Point in clause 3.8.1 must be read as a documentation Hold Point, with a review period of 5 Business Days. c) The Hold Point in clause 3.8.1 must be read as deleting the option for the Contractor to submit details of listed in the TfNSW Register of Concrete Mixes as conforming to TfNSW Specification TS 03270.2 Lean-Mix Concrete Subbase.
Clause 4.2.2(e) (Production Monitoring, Batching Record)	The batching records required by clause 4.2.2(e) must be included as part of the Quality Management Records.
Clause 4.3.6 (Mixing of Concrete) Hold Point	The Hold Point in clause 4.3.6 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 5.2 (Steel Reinforcement) Hold Point	The Hold Point in clause 5.2 must be read as a construction quality Hold Point, with 2 Business Days notification.
Clause 6.1 (Subbase Concrete Paving, General) Hold Point	a) The Hold Point in clause 6.1 must be read as a documentation Hold Point, with a review period of 2 Business Days. b) Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Clause 6.2.3 (Paving Crew) Hold Point	a) The Hold Point in relation to the providing the names of personnel in clause 6.1 must be read as a documentation Hold Point, with a review period of 10 Business Days. b) The Hold Point in relation to providing a statement in clause 6.1 must be read as a construction quality Hold Point, with 4 hours notification.
Clause 6.7.5 (Inspection)	Where nonconformity is detected, the Non-Conformance process (including rectification of the Non-Conformance) in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) must be followed and implemented before proceeding with the paving of the adjoining section.

Item	Amendment
Clause 6.11.2 (Assessment and Reporting) Hold Point	The Hold Point in relation to providing a statement in clause 6.11.2 must be read as a construction quality Hold Point, with 2 days notification.
Clause 6.12.3 (Trafficking of Subbase) Hold Point	The Hold Point in relation to the providing the names of personnel in clause 6.12.3 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 6.13.1 (Surface Debonding / Bonding Treatment, General) Hold Point	The Hold Point in relation to the providing a schedule in clause 6.13.1 must be read as a documentation Hold Point, with a review period of 5 Business Days. Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Clause 7.1.3 (Survey of LCS Finished Survey Levels)	The schedules of levels must be provided as part of the Quality Management Records. Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this 7.1.3 as part of any Non-Conformance Report.
Clause 8.2.2 (Crack Inspection) Witness Point	The Witness Point in clause 8.2.2 must be read as a construction quality Witness Point, with 1 day’s notification.
Clause 8.2.4 (Assessment of Non-typical Cracking) Hold Point	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause 8.2.4 as part of any Non-Conformance Report.
Clause 8.6 (Redesign of Pavement Levels)	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause 8.6 as part of any Non-Conformance Report.
Clause 8.8.2 (Sawcutting) Hold Point	Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable) and must include the details in this clause 8.8.2 as part of any Non-Conformance Report.

Table RD-PV-D3 4-5 Interpretation of TfNSW Specification TS 03271.2 Concrete Pavement Base - DC (IC-DC-R83 Ed 2/ Rev 4)

Item	Amendment
Clause 2.8.1 (Curing compound - Reference sample)	Written certification (accompanied by test results) required by clause 2.8.1 must be provided as part of the Construction Documentation.
Clause 2.8.2 (Curing compound - initial delivery)	Written certification (accompanied by test results) required by clause 2.8.2 must be provided as part of the Quality Management Records.
Clause 2.8.3 (Curing compound - subsequent deliveries)	Written certification required by clause 2.8.3 must be provided as part of the Quality Management Records.
Clause 3.2.2 (Survey Report prior to placing base) Hold Point	The Hold Point in clause 3.2.2 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 3.8.1 (Nominated Concrete Mixes) Hold Point	The Hold Point in clause 3.8.1 must be read as a construction quality Hold Point, with a review period of 5 Business Days. The Witness Point in clause 3.8.1 must be read as a construction quality Witness Point, with a notice period of 2 Business Days.

Item	Amendment
Clause 4.1.1 (Process Control - Placing Steel Reinforcement - General) Hold Point	The Hold Point in clause 4.1.1 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 4.2.1 (Process Control - Production and transport of Concrete - Production Mixes)	The batching records required by clause 4.2.1 to be provided as Quality Management Records
Clause 4.2.1.5 (Process Control Charts) Hold Point	a) The Hold Point in clause 4.2.1.5 must be read as a construction quality Hold Point, with a notification period of 2 Business Days. b) Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Clause 4.2.2.2 (Mixer uniformity testing) Hold Point	The Hold Point in clause 4.2.2.2 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 4.3.3 (Concreting Personnel - Paving Crew) Hold Points	a) The Hold Point in relation to providing the names of personnel in clause 4.3.3 must be read as a documentation Hold Point, with a review period of 10 Business Days. b) The Hold Point in relation to providing a statement in clause 4.3.3 must be read as a construction quality Hold Point, with 4 hours notification.
Clause 4.4.1 (Slipform Mechanical paving)	Record details of any interruptions to the progress of the paving, including the reason, location and duration to be submitted as part of the Quality Management Records.
Clause 4.4.4 (Temperature) a) and b)	Record concrete and air temperatures during placement of pavers required by clause 4.4.4 to be provided as part of the Quality Management Records.
Clause 4.4.8.4 (Trafficking of Base) Hold Point	The Hold Points in clause 4.4.8.4 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 4.5 (Concrete Paving Trials) Hold Point	The Hold Point in clause 4.5 must be read as a documentation Hold Point, with a review period of 2 Business Days.
Clause 4.6 Joints and Edges - Joint Cleaning and Sealants	The Witness Point in clause 4.6 must be read as a construction quality Witness Point, with a notice period of 2 Business Days.
Clause 5.1c) End product criteria - Concrete cracking	Within 4 days of paving, report all non-conforming cracking and submit scaled crack maps of all nonconforming cracking. Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Clause 5.2.4 (Within core variability) Hold Point	a) The Hold Point in clause 4.5 must be read as a construction quality Hold Point, with a notification period of 2 Business Days. b) Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).
Clause 5.6.1 (Removal and Replacement of Concrete Base) Hold point	a) The Hold Point in clause 4.5 must be read as a documentation Hold Point, with a review period of 2 Business Days. b) Any relevant nonconformity must be treated as a Non-Conformance in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).

Table RD-PV-D3 4-6 Interpretation of TfNSW Specification TS 03273.2 Diamond Grinding of Concrete Pavement - DC (IC-DC-R93 Ed 1/ Rev 1)

Item	Amendment
General	All references to Annexure R93/A are to be read as a reference to the Contract Documents.
Clause 3.2.3 (Setting out Work Area) Hold Point	The Hold Point in clause 3.2.2 must be read as a construction quality Hold Point, with 48 hours notification.
Clause 4.2 (Diamond Grinding Trial) Witness Point	The Witness Point in clause 4.2 must be read as a construction quality Witness Point, with 7 days notification.
Clause 4.2 (Diamond Grinding Trial) Hold Point	The Hold Point in clause 4.2 must be read as a construction quality Hold Point, with 5 Business Days notification.
Clause 5.3 Ride Quality	The results required by clause 5.3 must be submitted as part of the Quality Management Records.
Clause 5.5.1 (Conformity)	The signed certificate in clause 5.5.1 must be submitted as part of the Quality Management Records.

Table RD-PV-D3 4-7 Interpretation of TfNSW Specification TS 06306.2 Low Noise Diamond Grinding of Concrete Pavement - DC (IC-DC-R94 Ed 1/ Rev 1)

Item	Amendment
Clause 2 (Initial Ride Quality)	Submit the equipment calibration and system validation documents as part of the Construction Documentation.
Clause 3.5 (Grinding Plan)	The Hold Point in clause 3.5 must be read as a documentation Hold Point, with a review period of 20 Business Days.
Clause 4.5 (Measurement of Ride Quality and Texture Depth)	Submit the results required by clause 4.5 as part of the Quality Management Records.
Clause 4.6.1 (Diamond Grinding Trial Section, General) Witness Point, Hold Point	a) The Witness Point in clause 4.6.1 must be read as a construction quality Witness Point, with 7 days notification. b) The Hold Point in clause 4.6.1 must be read as a construction quality Hold Point, with a notification period of 2 Business Days.
Clause 4.6.1 (Diamond Grinding Trial Section, General) Hold Point	The Hold Point in clause 4.2 must be read as a construction quality Hold Point, with 5 Business Days notification.
Clause 4.7.1 (Management of Slurry) Hold Point	The Hold Point in clause 4.7.1 must be read as a documentation Hold Point, with a review period of 20 Business Days.
Clause 5.1 (Finished surface requirements) Witness Point	The Witness Point in clause 5.1 must be read as a construction quality Witness Point, with 7 days notification.

5 Tunnel pavements

5.1 General

a) The structural pavement for Tunnel carriageways must be a CRCP base with allowance for future diamond grinding (2 passes) for the full length and width of the carriageway.

b) Asphalt wearing courses must not be used within Tunnels.

c) Where the levels of CRCP are designed to change during the Design Life, the Contractor must design all features of the Works to accommodate such changes and must include in the relevant Maintenance Plan anything that may be sensitive to changes in finished surface levels of CRCP (e.g., by diamond grinding etc).

d) Cleaning of jointing prior to sealing must follow the details defined in TfNSW Test Method T379 Cleanliness of Sawn Concrete Pavement Joints.

e) Where traffic detector loops are required to be installed within the CRCP, the loops must be provided in accordance with RD-ITS-D1 “Design of Intelligent Transport Systems (ITS)”. A suitable methodology must be submitted as part of the Construction Documentation.

f) The CRCP base must be textured in accordance with TfNSW Specification TS 03271.2 Concrete Pavement Base - DC (IC-DC-R83 Ed 2/ Rev 4) and must meet all noise requirements as set out in PC-ENV4 “Noise Assessment, Treatment Design, and Implementation”. Low noise diamond grooving must be provided where low noise surfacing is required.

g) The CRCP base thickness design must include allowances for construction tolerance and future diamond grinding, in addition to the structural thickness determined by the AGPT Part 2 design procedure.

5.2 Undrained Tunnel pavements

The Contractor must ensure that Undrained Tunnel pavements meet the following requirements:

a) the subbase must be:

  i) lean mix concrete with a minimum design thickness of 150 mm; or

  ii) plant mixed cemented material, in accordance with TfNSW Specification TS 03267.2 R73 Plant Mixed Heavily Bound Pavement Course, with a minimum design thickness of 170 mm. A dense graded asphalt interlayer must be provided over any plant mixed cemented subbase, with a minimum thickness which is the greater of:

    A. 30 mm; and

    B. that required by RD-PV-D1 “Pavement Investigation and Design”;

b) the subbase thickness must be designed to support the construction traffic;

c) any backfill material placed in the Tunnel invert must have a suitable drain provided to ensure the performance of the pavement over its Design Life; and

d) where a structural slab is provided in lieu of a pavement subbase layer a suitable asphalt interlayer treatment must be provided.

5.3 Drained Tunnel pavements

For Drained Tunnel pavements:

a) where the subgrade is rock, the following requirements apply:

  i) the subbase must be no fines concrete, in accordance with TfNSW Specification TS 03269.2 R81 No Fines Concrete Subbase, with a minimum design thickness of 220 mm;

  ii) the no fines concrete subbase must be placed over a levelling denture concrete unless a cold milling machine is used for surface preparation of the rock subgrade where a clean, competent rock surface can be provided with no standing water; and

  iii) a dense graded asphalt interlayer must be provided between the no fines concrete subbase and the continuously reinforced concrete base, with a minimum thickness which is the greater of:

    A. 30 mm; and

    B. that required by RD-PV-D1 “Pavement Investigation and Design”;

b) where the subgrade is other than rock, and whenever a structural slab or similar structure is provided, a drainage layer must be provided with a minimum thickness of 300 mm, which complies with the following:

i) the drainage layer must have permeability greater than 600 m/day equivalent for unbound material and 2,000 m/day equivalent for bound material when tested in accordance with AS 1289 Methods of testing soils for engineering purposes;

ii) the drainage layer must have a design grading to minimise segregation and must have a separation layer at its upper surface to avoid contamination during construction; and

iii) where a no fines concrete subbase is not provided, a 300 mm thick layer of PM2/20 must be provided between the top of the drainage layer and the subbase;

c) the floor of the excavation must be trimmed to produce an even surface and to ensure that the minimum thickness of the drainage layer is achieved. All loose material must be removed, and any remaining uneven areas must be levelled with a profiler or mass concrete (denture concrete) to make the floor free draining; and

d) asphalt interlayers for CRCP must be in accordance with RD-BP-C3 “Construction of Asphalt Pavement”.

6 Pavement maintenance diaries

a) The Contractor must provide pavement maintenance diaries which detail the proposed performance, maintenance, rehabilitation, and reconstruction requirements required to ensure the Design Life of the concrete road pavements is met.

b) The pavement maintenance diaries in section 6a) must be developed as part of the Design Documentation and the Maintenance Plan.