



VicRoads Supplement to the Austroads Guide to Road Design

Part 8 – Process & Documentation

NOTE:

This VicRoads Supplement must be read in conjunction with the Austroads Guide to Road Design.

Reference to any VicRoads or other documentation refers to the latest version as publicly available on the VicRoads website or other external source.

VicRoads Supplement to the Austroads Guide to Road Design Updates Record

Part 8 – Process & Documentation

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This VicRoads Supplement has been developed by VicRoads Technical Services and authorised by the Executive Director – Policy and Programs.

The VicRoads Supplement to the Austroads Guide to Road Design provides additional information, clarification or jurisdiction specific design information and procedures which may be used on works financed wholly or in part by funds from VicRoads beyond that outlined in the Austroads Guide to Road Design guides.

Although this publication is believed to be correct at the time of printing, VicRoads does not accept responsibility for any consequences arising from the information contained in it. People using the information should apply, and rely upon, their own skill and judgement to the particular issue which they are considering. The procedures set out will be amended from time to time as found necessary.

References

AGRD – Austroads Guide to Road Design

GTEP – Guide to Traffic Engineering Practice (superseded)

VRD/RDG – VicRoads Road Design Guidelines (superseded)

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Austroads (2009). Austroads Guide to Road Safety - Part 6: Road Safety Audit.

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VicRoads (2008). Road Safety Audit Policy.

VicRoads (latest). Final Drawing Presentation Guidelines.

VicRoads (latest). VicRoads Supplement to the Austroads Guide to Road Design – all supplements.

VicRoads (latest). VicRoads Standard Drawings for Roadworks.

VicRoads Traffic Engineering Manual Volume 1 – Traffic Management.

VicRoads Traffic Engineering Manual Volume 2 – Signs and Markings.

VicRoads (latest). Road Design Notes - various

1.0 Introduction

1.1 Scope of this Guide

Refer to VicRoads documentation for local terminology and specific requirements.

1.2 International Standard

As noted in the *Austrroads Guide to Road Design (AGRD) Part 8: Process & Documentation*, the Guide does not seek to prescribe the management systems required to undertake road design. Those engaged to undertake design works for VicRoads shall be accredited through VicRoads Prequalification Scheme. Accreditation through the scheme requires consultants to have an operational quality management system. Refer to VicRoads website for further details regarding these requirements.

1.3 Road Safety

VicRoads has no supplementary comments for this section.

1.4 Terminology

VicRoads Glossary of Terms (from RDG Part 10 – Glossary)

Additional Information

Design Brief: A document detailing the scope, content, and the design outputs of a project.

Design Review: The planned and formally documented process carried out at appropriate stages of design where representatives of all functions and specialist advisers evaluate the total design for function, safety, constructability, project specific requirements, aesthetics and economy.

Distinct Work Package: A design task or section of design that all design data, acceptance criteria has been obtained, and the extent of the design work can be clearly defined.

Concept Design: A schematic drawing that may show the approximate location of the road alignment, and road configuration but does not necessarily specify any dimensions or geometry set out details. Concept design is used to develop a functional layout.

Functional Design: Is a dimensioned drawing that shows the location of the road alignment, and complete road configuration and may include geometry

set out details. Functional design is sufficiently detailed to enable detail design to proceed.

Project Leader: Person responsible for managing the project resources and design activities.

Quality Plan: A document setting out the specific quality practices, resources, project responsibilities and sequence of activities, and cross reference to the design brief.

Verification: The formal documented processes carried out at appropriate stages of design by suitably qualified and competent persons to ensure that the design stage output has been accurately produced and meets the design stage input requirements.

1.5 Phases of Design

VicRoads has no supplementary comments for this section.

1.6 Depth of Design Detail versus Construction Delivery Mechanism

VicRoads has no supplementary comments for this section.

2.0 Preparation for Design

2.1 Overview

VicRoads has no supplementary comments for this section.

2.2 Design Control Process

VicRoads has no supplementary comments for this section.

2.3 Use of Design Control Aids

This Supplement includes a range of design control aids which may be used to assist in the preparation of a road design. These control aids are included in the appendices.

2.4 Client and Designer Interaction

Additional Information

V2.4.4 Project Leader's Responsibilities (from RDG Section 10.1.3.1)

The Project Leader should determine the degree of checking and review required for a project based on the assessment of:

- (a) the type of project
- (b) project complexity

- (c) knowledge and skills of the designer(s) involved and
- (d) technology being utilised, taking into account the clients requirements.

The Project Leader shall ensure that the control activities are adequately resourced, and sufficient time has been allocated. The verification activities shall be included in the project design program.

Where a verification activity identifies a conflict between the client's requirements and good design standards, principles, road safety, constructability and/or cost the Project Leader shall resolve the conflict with the client.

2.5 Scope of the Design

V2.5.3.1 Guidance for Contract Review

Additional Information

The checking aids provided in the appendices are in two parts:

Appendix VA.1: Contract Review Checklist – Client Relationship; and

Appendix VA.2: Contract Review Checklist – Technical Review.

The checklists have been structured into four columns covering:

- (a) **Reference:** to provide a list of design references, or documentation that can be used to locate applicable standards and/or policy.
- (b) **Checklist Item:** to provide a list of prompts that can be used as a reference during the contract review process.
- (c) **Check Date:** to assist in the tracking of the contract review process and recording the depth of the review.
- (d) **Comments:** to provide for recording the outcomes of checks or responses that require further follow up.

2.6 Design Development Inputs

2.6.5 Road Safety Audits

Additional Information

VicRoads maintains a policy to undertake road safety audits throughout the planning, design and construction stages of road and bridge projects in accordance with the *Austroads Guide to Road Safety - Part 6: Road Safety Audit AGRS 06/09* (Austroads, 2009).

VicRoads Road Safety Audit Policy (VicRoads, 2008) applies to all projects involving works

on freeways and arterial roads and works on municipal roads funded by VicRoads. These include projects/ works undertaken on the freeway and arterial road network by land developers and other organisations, and public transport related works undertaken by other government departments.

Risk assessments must be undertaken to determine the stage or stages at which road safety audits will be required. The reasons for selection of audit stages, or exemptions to the requirement for road safety audits should be documented. Road safety audits should be undertaken as follows:

Project Cost	Audit Stages Required
> \$5.0m	Audits should be undertaken at all stages
\$0.15m to \$5.0m	Risk assessments should be undertaken to determine the stages of audit. In general, at a minimum, audits should be undertaken at one of the design stages.
< \$0.15m	Risk assessments should be undertaken to determine the stages that the audits should be carried out.

2.7 Design Development Output

VicRoads has no supplementary comments for this section.

3.0 Design Development

3.1 Overview

VicRoads has no supplementary comments for this section.

3.2 Producing the Road Design

3.2.5 Stage(s) of Completion

V3.2.5.1 Designer's Responsibilities (from RDG Section 10.1.3.2)

Additional Information

A designer shall progressively check his/her own work during development of the design, recording clearly and concisely any design data used, calculations, analysis, considerations and assumption adopted. The design outputs should be in accordance with the project requirements and presentation standards.

A designer on reaching a checking hold point or completion of the design task shall:

- Compile all design data, design outputs and other relevant details
- Sign and date the above design documentation
- Advise the Project Leader that a checking hold point has been reached, or that the design task has been completed.

Where a design discrepancy has been identified either through self checking or by another checker, the designer shall review the implications of an amendment on associated design components.

3.3 Matters Specific to Each Design Phase

VicRoads has no supplementary comments for this section.

3.4 Design Control

3.4.3 Detailing the Design

Refer to *VicRoads Standard Drawings for Roadworks* where they exist for specific design elements. The Standard Drawings and Road Design Notes (RDNs) are available on VicRoads website.

3.5 Design Self Checks

VicRoads has no supplementary comments for this section.

3.6 Design Interfaces

VicRoads has no supplementary comments for this section.

3.7 Workplace Health and Safety/Safe Design

VicRoads, along with all agencies, consultants and contractors involved in the procurement and maintenance of assets, is required to consider the designer duties under Section 28 of the *Occupational Health and Safety Act 2004*.

3.8 Constructability and Maintainability

VicRoads has no supplementary comments for this section.

3.9 Extending the Design Domain

Refer to *VicRoads Supplement to AGRD Part 2* for further details on the application of EDD criteria.

3.10 Quantities

VicRoads has no supplementary comments for this section.

4.0 Design Review, Verification and Validation

4.1 Overview

VicRoads has no supplementary comments for this section.

4.2 Independence in the Process

VicRoads has no supplementary comments for this section.

4.3 Design Review

VicRoads has no supplementary comments for this section.

4.4 Additional Aspects to the Review Process

VicRoads has no supplementary comments for this section.

4.5 Design Interface Review

VicRoads has no supplementary comments for this section.

4.6 Incorporating the Review Response

VicRoads has no supplementary comments for this section.

4.7 Dealing with Design Non-conformance/Departures

4.7.1 Control of Non-conforming Product in Design

Refer to *VicRoads Supplement to AGRD Part 2* for further details on the application of EDD.

4.7.2 Design Departures/Exceptions

Additional Information

Should a design exception be identified during the development of a road design, it is incumbent upon the designer to notify the client of this non-conformance with the design brief. The client shall accept the design exception where they have the delegated authority to do so. Generally this would reside with the project leader or relevant VicRoads Business Area Manager (or Contract Superintendent) as applicable, depending on the scope/scale of the identified non-conformance.

Appropriate documentation regarding the design exception and reasons for acceptance

is required. A risk assessment process similar to that discussed for Extended Design Domain should be followed.

4.8 Dealing with Variations

VicRoads has no supplementary comments for this section.

4.9 Design Development Verification

VicRoads has no supplementary comments for this section.

4.10 Design Development Validation

VicRoads has no supplementary comments for this section.

5.0 Design Audit Process

5.1 Overview

V5.1.1 Documentation

(from RDG Section 10.6.3)

Additional Information

The completed audit checklists provide a summary of the depth of design process review. Supportive evidence of the satisfactory completion and compliance with the control process needs to be maintained and would generally include:

- Minutes of meetings and discussions,
- Record of design variations,
- Record of design discrepancies,
- Correspondence (including e-mail and faxes) seeking clarification or requests for information.
- Program of works
- Checking documentation
- Design files, including package files.
- Corrective Action Requests.

5.2 Design Process Audit

VicRoads has no supplementary comments for this section.

5.3 Design Product Audit

VicRoads has no supplementary comments for this section.

6.0 Presentation of Outputs

6.1 Overview

VicRoads presentation requirements are available in *VicRoads Final Drawing Presentation Guidelines*, available on VicRoads website.

Figure V6.1 illustrates the design output checking process.

V6.1.1 Checking Aids

(from RDG Section 10.4 Design Output Checks – 10.4.3 Checking Aids)

Additional Information

The checking aids provided in Appendix VB are in two parts, (a) Designer Aids and (b) Co-ordination Review.

Designer Aids: provide a series of items that may assist a designer in questioning, identifying and tracking design issues that need to be considered. The use of these design prompts sheets is optional.

Co-ordination Review Aids: represents a generic design checklist that must be reviewed for appropriateness for each work package prior to adoption. Where more design check items are necessary they shall be added for completeness. The checklist should be used progressively throughout the development of the design by the designer and checker, rather than at the completion of the design in order to prevent significant redesign work due to errors.

The checklists have been structured into five columns covering:

- (a) Reference: to provide a list of design references, or documentation that can be used to locate applicable standards and/or policy.
- (b) Checklist Item: to provide a list of prompts that can be used as a reference during development of the design and independent checking.
- (c) Designer Date: to assist in the tracking of the design checks by the designer and to record the depth of the checking. The column must be initialled and dated to verify that the check was completed.
- (d) Check Date: to assist in the tracking of the design output checks and recording the depth of the review. The column must be initialled and dated to verify that the check was completed. (Note:

This column has not been providing on the design prompt sheets).

- (e) Comments: to provide for recording the outcomes of checks or responses that require further follow up. Supervisor agreements must be recorded or cross referenced in this column.

6.2 Typical Sheets Contents

VicRoads has no supplementary comments for this section.

6.3 Organisation of CADD Data

VicRoads has no supplementary comments for this section.

6.4 Preparation of CADD Drawings

VicRoads has no supplementary comments for this section.

6.5 Phase 2 – Design Composition

VicRoads has no supplementary comments for this section.

6.6 Phase 3 – Design Composition

VicRoads has no supplementary comments for this section.

6.7 Standard Feature labels for Data Groups

VicRoads has no supplementary comments for this section.

6.8 Standard Symbols

VicRoads has no supplementary comments for this section.

6.9 Supplementary Design Elements and Criteria

VicRoads has no supplementary comments for this section.

References

VicRoads has no supplementary comments for this section.

Tables and Figures

VicRoads has no supplementary comments for this section.

Appendix VA – Contract Review Checklists

These checklists have been extracted from the now superseded *VicRoads Road Design Guidelines (RDG) Part 10*.

Appendix VA.1: Contract Review Checklist – Client Relationship (including availability of information) (from RDG Part 10.2 – Appendix 2 – A1); and

Appendix VA.2: Contract Review Checklist – Technical Review (from RDG Part 10.2 – Appendix 2 – A2).

Appendix VB – Design Checklist and Aids

The following checklists and aids contained in Appendix B have been extracted from the now superseded *VicRoads Road Design Guidelines (RDG) Part 10 - Appendix 4*.

Appendix VB.1: Horizontal Alignment

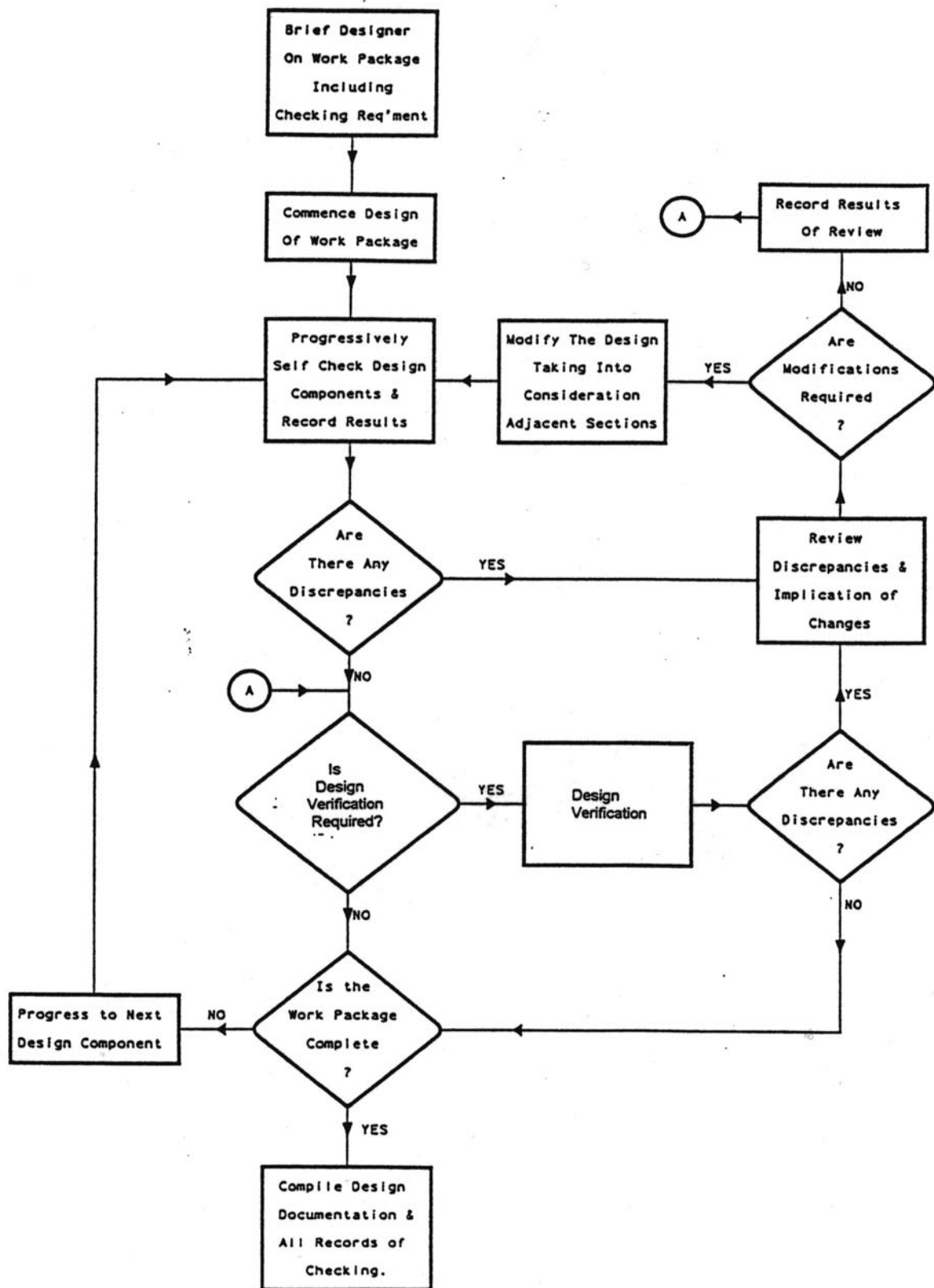
Appendix VB.2: Vertical Alignment

Appendix VB.3: Coordination of Horizontal and Vertical Geometry

Appendix VB.4: Intersection Functional Layouts

Appendix VB.5: Drainage

Figure V6.1 Design Output Checking Process
(from RDG Fig 10.4.1)



Appendix VA.1: Contract Review Checklist (Client Relationship)
 (from RDG Part 10.2, Appendix 2 – A1)

Project Name:	_____		
Project Section:		Chainage:	
		from	to
Drawing No:	_____		
Reviewer:	_____	Checker:	_____

REFERENCE	CHECK ITEMS	CHECK DATE	COMMENTS
	Scope and extent of work		
	Availability of the following information:		
	Project concept report		
	Environmental Effect Statement		
	Materials investigation reports		
	Design (concept) status report		
	Traffic engineering reports		
	Safety review report		
	Availability of design data files:		
	Survey files		
	Design files		
	Drawing files		
	Utility services (existing & proposed)		
	Design (concept) criteria specification:		
	Listings of design guides		
	Reference materials		
	Standards adopted		
	Environmental studies:		
	Cultural Heritage site surveys		
	Flora & fauna surveys		
	Noise studies/surveys		
	Community issues		
	Community consultation involvement		
	Time to be allowed		
	Municipal and Planning Authority reqts:		
	Environmental controls		
	Conservation areas		
	Historical buildings		
	Planning permits		
	Planning scheme classification		
	ROW concerns/controls		

REFERENCE	CHECK ITEMS	CHECK DATE	COMMENTS
	Access controls		
	Project staging requirements		
	Project control requirements:		
	Hold points		
	Design reviews		
	Road safety review		
	Proof engineering		
	Responsibility for Service Information:		
	Contacting authorities		
	Obtaining agreements/approvals		
	Responsibility for decision making:		
	Who is involved		
	Who makes decisions		
	List of project contact/liaison officers		
	Project superintendent		
	Project Quality Representative		
	Process for design variations approval and variations		
	Can the design concept be varied or alternative proposed		
	What type of after service will be provided		
	Type of documentation required:		
	Hardcopy – Number of		
	Electronic – Format		
	Presentation of design:		
	Colour photocopying		
	Drawing size A3		
	Other		
	Project time frame		
	Budgetary / constraints		
	Type of contract:		
	Limiting fee		
	Lump sum		
	Fees for additional work		
	Progressive payment		
	Contract Conditions:		
	Security deposit		
	Retention money		
	Liquidated damages		
	Insurance policies		

Appendix VA.2: Contract Review Checklist (Technical Relationship)
 (from RDG Part 10.2, Appendix 2 – A2)

Project Name:	_____		
Project Section:		Chainage:	
		from	to
Drawing No:	_____		
Reviewer:	_____	Checker:	_____

REFERENCE	CHECK ITEMS	CHECK DATE	COMMENTS
	Concept and Functional Layout Review;		
	Have the following design issues been considered:		
	Road side features, e.g. landscape, environmental aspects		
	Rest area and service centre locations		
	Traffic volumes and turning movements		
	Traffic composition		
	Traffic lane widths		
	Public transport lanes		
	Emergency lanes		
	Land acquisition		
	Cross section elements		
	ROW boundary constraints		
	Vertical clearances along the project		
	The operating speed along the project is consistent with:		
	Topography		
	Adjacent development		
	Road function		
	Cross section		
	Road classification		
	Road users expectation		
	Functional Layout Review		
	Alignment approaches to structures adequate with respect to:		
	Horizontal & vertical curves		
	Superelevation development		
	Sight distance		
	Horizontal and vertical alignments consistent with visibility requirements:		
	Along the road and at junctions		
	Access points		
	Pedestrian and cyclist crossings		

REFERENCE	CHECK ITEMS	CHECK DATE	COMMENTS
	Is the frequency of crossing either too high or too low in relation to:		
	Safety access		
	Impact on surrounding/adjacent or superseded lengths of road		
	Disruption to traffic movements		
	Access of emergency vehicles & public transport		
	Are all road users, including pedestrians and non motorised users provided for		
	Do the proposed connections to the existing road occur at hazardous locations		
	Future Development:		
	Will the approved concept provide consistent design standards in relation to adjacent road standards		
	Will future upgrading of the approved concept be possible without compromising safety and practices		
	Has stage construction been addressed:		
	Traffic operation		
	Construction safety		
	Side track connections		
	Drainage		
	What regulatory and statutory requirements affect or need to be addressed as part of the design		
	Critical design control identified & information on cost of replacement, location adequately verified		
	Design Data		
	Site visit details verify design inputs and design controls		
	Design input data adequacy:		
	Environmental effect statement/EIS		
	Materials investigation reports		
	Design (concept) status reports		
	Traffic engineering reports		
	Safety review report		
	Environmental studies		
	Structure details		
	Survey files		
	Design files		
	Drawing files		
	Utility services (existing & proposed)		
	Listings of design guides		
	Reference materials		

REFERENCE	CHECK ITEMS	CHECK DATE	COMMENTS
	Standards adopted		
	Other Details		

Legend

AGRD – Austroads Guide to Road Design

AGTM – Austroads Guide to Traffic Management

GTEP – Austroads Guide to Traffic Engineering Practice (superseded)

RDG – VicRoads Road Design Guideline Part 7: Drainage (all other RDG Parts are superseded)

RDN – VicRoads Road Design Note (available on VicRoads website)

Task Brief – Design Specification

TEM – VicRoads Traffic Engineering Manual

VRS – VicRoads Supplement to AGRD (available through VicRoads website at its online bookshop)

Appendix VB – Design Checklist and Aids

Appendix VB.1: Horizontal alignment – Designer Aid (from RDG Part 10, Appendix 4 – A1)

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief Contract Review	Task brief Contract review	The selected horizontal alignment addresses:			
AGRD & VRS Part 3-3, 3-5, 3-8	RDG Part 2, Sect. 2, 3, 5	Operating speed			
		Existing terrain			
		Approach to bridge structures			
		Acquisition of land			
		Minimises conflict with services			
		Clearances to row boundaries			
Task brief Contract Review	Task brief Contract Review	Cross Section fits within the Right of Way and is consistent with:			
AGRD & VRS Part 3-5, 3-6	RDG Part 2, Sect. 3, 6	Operating speed			
AGRD & VRS Part 3-5	RDG Sect. 3	Traffic composition			
These RDNs no longer exist	RDN No. 3- 12, 3-13, 3-14, 3-15	Services constraints			
Task brief Contract Review	Task brief Contract Review	Selection of curves and spiral transitions address:			
AGRD & VRS Part 3-3.8	RDG Part 2, Sect 5	Radii and required lane width			
		Lateral friction factors			
		Distance between tangent points is adequate for superelevation development			
		Spiral lengths requirements			
		Isolated curves of small radius have been avoided			
		Effect of road curvature on stopping sight distance			
		Consistency of radii adopted along the alignment			
AGRD & VRS Part 3-3.6, 3- 7.7	RDG Part 2, Sect 7	Superelevation development length			
		Appropriate for the design speed and curve			
		Adequate for the development within straight or spiral			
		Been correctly located			
		Clear of bridge abutments			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 3-5, 3-7	RDG Part 2, Sect. 4	Sight distance requirements have been addressed:			
		Lateral sight distance			
		Entering sight distance			
		Approach sight distance			
		Safe intersection sight distance			
Task brief Contract Review AGRD & VRS Part 6B RDN 06-01	Task brief Contract review RDG 2, Sect. 6 RDN No. 79	Noise wall locations			
AGRD & VRS to AGRD Part 6-4.2, Part 3.5 RDN 06-02	RDG Sect. 3, 3-1, 3-8, 3-9, 3-15	Location of safety barriers:			
		Terminal locations			
		Objects being protected			
		Clear zones			
		Run-out areas			
Task brief Contract Review AGRD & VRS Part 6B & Part 3-6.3	Task brief Contract review RDG 2, Sect. 6 RDN No. 79	Landscape requirements			
		Batters slope			
		Land forming requirements			
AGRD & VRS Part 3-6	RDG Part 2, Sect. 10	Co-ordination of horizontal and vertical geometry			
AGRD & VRS Part 3-6		Other horizontal criteria			

Legend:

AGRD – Austroads Guide to Road Design

AGTM – Austroads Guide to Traffic Management

GTEP – Austroads Guide to Traffic Engineering Practice (superseded)

RDG – VicRoads Road Design Guideline Part 7: Drainage (all other RDGs are superseded)

RDN – VicRoads Road Design Note (available on VicRoads website)

Task Brief – Design Specification

TEM – VicRoads Traffic Engineering Manual

VRS – VicRoads Supplement to AGRD (available through VicRoads website at its online bookshop)

Appendix VB.2: Vertical Alignment – Designer Aid (from RDG Part 10, Appendix 4 – A2)

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief AGRD & VRS Part 3-8.5	Task brief RDG Part 2, Sect. 6.5	Maximum and minimum grades			
		Minimum			
		Maximum			
AGRD & VRS Part 3-7.7, 3-8, 3-8.5	RDG Part 2, Sect. 5, 7	Location of horizontal curves and superelevation development			
AGRD & VRS Part 3-8.2, 3-7, 3-8	RDG Part 2, Sect. 6.6	Vertical curves meet the design standards and requirements for:			
AGRD & VRS Part 3-8.6,		Sag curves			
AGRD & VRS Part 3-8.6		Crest curves			
		Provide appropriate vertical sight distance			
		Level of driver comfort			
		Use of straights and curves to provide a smooth gradeline without hidden dips			
		Co-ordination of horizontal and vertical curves			
Task brief Contract Review	Task brief Contract Review	The vertical grading addresses:			
		Flood levels			
AGRD & VRS Part 3-7.7, 3-8	RDG Part 2, Sect. 6.4, 6.7	Existing pavement levels			
		Superelevation requirements:			
		Rotation of pavement			
		Future overlay levels			
		Future overlay structures			
		Matching to bridge levels			
		Pavement depth on bridge structure been considered			
		Driver safety, comfort and vertical alignment appearance is satisfactory			
Task brief Contract Review AGRD & VRS Part 3-8	Task brief Contract review	Clearance to services and structures overhead			
	RDG Part 2, Sect. 6.4. 6.7	Underground			
		Lateral clearance			
Task brief Contract Review	Task brief Contract review	Resheet / overlay controls			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief Contract Review AGRD & VRS Part 3-5	Task brief Contract Review RDG Sect. 3.0 RDN No. 79	Depth of cuts/fills:			
		Batter slopes can be constructed taking into consideration the soil type/condition			
		Height of the batters not excessive			
		Batter slopes driveable			
		Benching required			
		Protection requirements			
		Erosion controls measures needed e.g. Beaching, catch drains			
AGRD & VRS Part 3 AGRD & VRS Parts 4, 4A, & 4B AGTM/VRS Part 6	RDG Part 2, Sect. 4.4, 4.11 Aust Part 5 & 6	Grades through intersections adequate for:			
		Sight distance			
		Stopping			
		Merge and diverge areas visible and of adequate length			
		Turning movements are not affected by adverse crossfall			
AGRD & VRS Part 3-8 AGRD & VRS Part 5 RDG Part 7-3, 7- 4	RDG Part 2, Sect. 6.7 RDG Part 7, Sect. 7.3 & 7.4	Adequate drainage provided at:			
		Vertical sag curves in cut			
		Large vertical crest curves in cut			
		Superelevation level points			
Task brief Contract Review AGRD & VRS Part 3-9	Task brief Contract Review RDG Part 2, Sect.	Adequacy of overtaking provisions			
AGRD & VRS Part 3-8.7	RDG Part 2, Sect. 8	Earthwork quantities in balance			
		Other vertical grading criteria			

Legend:

AGRD – Austroads Guide to Road Design

AGTM – Austroads Guide to Traffic Management

GTEP – Austroads Guide to Traffic Engineering
Practice (superseded)

RDG – VicRoads Road Design Guideline Part 7:
Drainage (all other RDGs are superseded)

RDN – VicRoads Road Design Note (available on
VicRoads website)

Task Brief – Design Specification

TEM – VicRoads Traffic Engineering Manual

VRS – VicRoads Supplement to AGRD (available
through VicRoads website at its online
bookshop)

Appendix VB.3: Co-ordination of horizontal & vertical geometry – Designer Aid (from RDG Part 10, Appendix 4-B1)

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Horizontal control criteria			
Task brief Contract Review AGRD & VRS Part 3-8, 3- 6.3	Task brief Contract Review RDG Part 2, Sect. 5.1, 6.4	Minimum lateral clearance to non relocatable			
		Structures			
		Services			
		Features (monuments etc)			
Task brief Contract Review	Task brief, Contract Review	Minimum clearance to row boundaries			
AGRD & VRS Part 3-3	RDG Part 2, Sect. 3.0	Operating speed			
AGRD & VRS Part 3-7	RDG Part 2, Sect. 5.4, 5.6	Horizontal curve criteria			
AGRD & VRS Part 3-7.7, 3- 7.3	RDG Part 2, Sect. 7.3 RDG Part 2, Sect. 7.7	Superelevation requirements			
AGRD & VRS Part 3-9	RDG Part 2, Sect. 8.11	Overtaking provisions			
AGRD & VRS Part 3	RDG Sect. 3.0	Cross Section requirements			
Task brief Contract Review	Task brief Contract Review	Location and type of grade separation interchange			
		Overpass			
		Underpass			
Task brief Contract Review AGRD & VRS Part 4 & 4A AGTM & VRS Part 6	Task brief Contract Review Aust Part 5	Median, outer separator and emergency opening locations			
Task brief Contract Review	Task brief Contract Review	Public transport requirements			
Task brief Contract Review	Task brief Contract Review	Stage construction requirements			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief Contract Review AGRD & VRS Part 3 AGRD & VRS Part 6A	Task brief Contract Review Aust Part 13 & 14	Pedestrian and bicycle requirements			
Task brief Contract Review	Task brief Contract Review	Other horizontal controls			
		Vertical control constraints			
Task brief Contract Review	Task brief Contract Review	Structure clearance controls			
		Structural depth			
		Bridge deck levels			
Task brief Contract Review	Task brief Contract Review RDG Sect. 3.0	Clearances to services			
		Underground			
		Overhead			
Task brief Contract Review	Task brief Contract Review	Control levels			
		Building lines			
		Access level			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-1, 7-3, 7-4, 7-7 RDN 05-01 RDN 05-02	Task brief Contract Review RDG Part 7, Sect. 7.1, 7.3, 7.4, 7.7 RDN No. 44	Drainage controls			
		Flood levels			
		Culvert controls			
		Sub surface controls			
		Location of low points			
Task brief Contract Review AGRD & VRS Part 3	Task brief Contract Review RDG XX Sect. 3.0	Crossfalls			
		Medians			
		Footpaths			
		Pavements			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief Contract Review	Task brief Contract Review	Resheet/overlay controls			
		Other vertical controls			
		Coordination of horizontal and vertical geometry			
AGRD & VRS Part 3-8, 3-6	RDG Part 2, Sect. 5, 6, 10	Does the geometry conform with the terrain			
AGRD & VRS Part 3-7	RDG Part 2, Sect. 6.5	Grade changes minimised			
AGRD & VRS Part 3-8, 3-9	RDG Part 2, Sect. 5.8	Use of compound curves been avoided, if not are the curves of suitable radii			
AGRD & VRS Part 3	RDG Part 2, Sect. 5.4, 8.6	Have adequate lengths of straight been provided			
		Between curves			
		For passing opportunities			
AGRD & VRS Part 3-7, 3-8	RDG Part 2, Sect. 10.3, 10.4	Horizontal and vertical geometry in phase:			
		Alignment appearance has no kinks or hidden dips			
		Does the alignment provide a consistent standard free from sudden changes			
AGRD & VRS Part 3-9	RDG Part 2, Sect. 8.6	Have sufficient passing opportunities been provided in accordance with all route requirements			
Task brief Contract Review	Task brief Contract review	High vehicle detour been provided where there is conflict with vertical clearance			
AGRD & VRS Part 3-7	RDG Part 2, Sect. 7.4	Location of adverse superelevation and curve radii			
AGRD & VRS Part 3-8.7, 3-10	RDG Part 2, Sect. 6.4, 10.4	Alignment approaches to structures are adequate with respect to:			
		Cut and fill			
		Bridge location clear of horizontal and vertical curves			
Task brief Contract Review AGRD & VRS Part 3-3	Task brief Contract Review RDG Part 2, Sect. 3.0	Operating speed for:			
		Main carriageways			
		Entry ramp			
		Exit ramp			
		Side roads			
		Access roads			
		Is the operation speed consistent for the alignment			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 3-7, 3-5, 3-6	RDG Part 2, Sect. 4.0, 4.20	Effect of horizontal and vertical geometry on sight distance taking into account:			
		Stopping sight correction factors			
		Horizontal and vertical approaches to curves			
		Design vehicles			
		Intersection			
		Property access			
		Structures			
		Pedestrians			
		Cyclists			
AGRD & VRS Part 3 AGRD & VRS Part 4 AGRD & VRS Part 6A	RDG Part 2, Sect. 4.11	Geometric design of the side road approaches have adequate sight distance to:			
		Intersection e.g. Traffic islands, linemarking & signage			
		Pedestrians			
		Cyclists			
AGRD & VRS Part 3-7	RDG Part 2, Sect. 7.5, 7.7, 7.8, 7.9	Superelevation rotation location with respect to:			
		Structures			
		Intersections			
		Lengths of spirals			
		Sag and crest curves			
		Grading of outer edges of carriageways, kerb and channel, table drain			
AGRD & VRS Part 3-10.3	RDG Part 2, Sect. 7.8	The reduction in effective crossfall due to sleep down grades at horizontal curves			
AGRD & VRS Part 3-7, 3-8, 3-10	RDG Part 2, Sect. 7.3, 7.8	Application of superelevation for each curve:			
		Super development			
		Relative grades			
		Longitudinal grades			
		Water flow depths			
		Location of flat spots			
		Crowing details			
Task brief Contract Review AGRD & VRS Part 3-4	Task brief Contract Review RDG Sect. 3.0	Design levels controls have been addressed:			
		Building lines			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Low points			
		Crossfall			
		Access points			
Task brief Contract Review AGRD & VRS Part 3-4, 3-6	Task brief Contract review RDG XX Sect. 3.0 RDG Part 2, Sect. 6.4	Clearances horizontal and vertical boundaries address:			
		Services location and address			
		Batter location			
		Footpath			
		Bicycle path			
		Noise attenuation requirements			
		Landscape requirements			
Task brief Contract Review AGRD & VRS Part 3-4.1	Task brief Contract Review RDG Part 2, Sect. 3	Construction staging controls have been addressed:			
		Operating speed for the departure and approach to the proposed design			
		Driver visibility to the change in road environment			
Task brief Contract Review	Task brief Contact Review	Other geometry coordination considerations:			

Legend:

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**Appendix VB.4: Intersection functional layouts – Designer Aid
(from RDG Part 10, Appendix 4 – B2)**

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Design criteria			
Task brief Contract Review	Task brief Contract Review	Traffic details			
		Volumes			
		Composition			
		Peak hour volumes			
		Traffic direction			
Task brief Contract Review	Task brief Contract Review	Pedestrian volumes and movements			
AGRD & VRS Part 4	Aust Part 5, Sect. 6	Design requirements			
AGRD & VRS Part 6A	Aust Part 13	Bicycle volumes and movements			
Task brief Contract Review AGRD & VRS Part 4-5 AGRD & VRS Part 6A	Task brief Contract review Aust Part 5, Sect. 6 Aust Part 14	Design requirements			
Task brief Contract Review	Task brief Contract Review	Traffic turning movements			
		Left turns			
		Right turns			
Task brief Contract Review	Task brief Contract Review	Design vehicles			
		Semi trailer			
		Restrictive access vehicles			
		Buses			
		Other			
Task brief Contract Review	Task brief Contract Review	Public transport requirements:			
		Bus stop locations			
		Mid block			
		Departure side of intersection			
		Approach side of intersection			
		Property access requirements and location			
Task brief Contract Review	Task brief Contract Review	Horizontal clearances to:			
		Row boundaries			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Services			
		Structures			
Task brief Contract Review AGRD & VRS Part 3-5	Task brief Contract review RDG Part 2, Sect. 3	Operating speed on approach legs to intersection			
Task brief Contract Review	Task brief Contract review	Intersection Cross Section:			
AGRD & VRS Part 5	Aust Part 5,	Through lane widths			
AGRD & VRS Part 3-4	RDG Sect. 3	Number of lanes			
		Auxiliary lane width			
		Median widths			
Task brief Contract Review	Task brief Contract Review	Right turn lane treatment:			
AGRD & VRS Part 4A		Lane width			
AGRD & VRS Part 4A-3	Aust Part 5.	Right turn lane storage length			
AGRD & VRS Part 3-9.9 AGRD & VRS Part 4	RDG Sect. 3	Taper lengths			
		Deceleration length			
Task brief Contract Review	Task brief Contract Review	Left turn lane treatment			
		Free flow			
AGRD & VRS Part 3-4.3 AGRD & VRS Part 4-4.5 AGRD & VRS Part 4A-4.6, 4A-4.5, 4A- 8.3	Aust Part 5, Sect. 5	High angle			
		Lane width			
		Left turn lane storage length			
		Deceleration length			
		Acceleration length			
AGRD & VRS Part 3-9.9 AGRD & VRS Part 4		Taper length			
Task brief Contract Review	Task brief Contract Review	Pavement taper lengths			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 4A-6	Aust Part 5,	Merge			
AGRD & VRS Part 3-9	RDG XX Sect. 5	Diverge			
Task brief Contract Review	Task brief Contract Review	Median treatment details:			
AGRD & VRS Part 4-7	Aust Part 5	Median widths			
	RDG Sect. 5	Island length			
Task brief Contract Review	Task brief Contract Review	Parking requirements:			
AGRD & VRS Part 4	Aust Part 5	Number of bays			
AGRD & VRS Part 3-4	RDG Sect. 6	Parking			
AGRD & VRS Part 3-8	RDG Part 2, Sect. 6.5	Vertical grades through intersection			
		Major road			
		Minor roads			
AGRD & VRS Part 3-8, 3- Table 8.1	RDG Part 2, Sect. 6.4	Vertical clearances to:			
		Structures			
		Services			
AGRD & VRS Part 3-4 AGRD & VRS Part 4-10	RDG Part 2, Sect. 6	Vertical grading controls			
		Existing pavement levels			
		Pavement resheet depths			
Task brief Contract Review	Task brief Contract Review	Other design criteria			
		Intersection design checks			
AGRD & VRS Part 3-5 AGRD & VRS Part 4A	RDG Part 2, Sect. 4.11	Approach alignment to the intersection			
		Clearly visible			
		Lane configuration not confusing			
		Safety roads clearly visible			
		Driver decisions kept to a minimum			
AGRD & VRS Part 3 AGRD & VRS Part 4	RDG Part 2, Sect. 4.19, 4.20	Alignment through the intersection not confusing to the driver			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 3 AGRD & VRS Part 4	RDG Part 2, Sect. 4.19, 4.20 Aust Part 5, Sect. 3, 5	Intersection departure alignment not confusing to driver			
AGRD & VRS Part 4 & 4A	Aust Part 5, Sect. 3, 5	Intersection area clearly defined			
AGRD & VRS Part 3	RDG Part 2, Sect. 4.11	Intersection sight distance requirement been met on all approaches:			
AGRD & VRS Part 4 & 4A	Aust Part 5, Sect. 5	Safe intersection sight distance			
		Entering sight distance			
		Approach sight distance			
		Lateral sight distance			
AGRD & VRS Part 3	RDG Part 2, Sect. 4.11	Driver sight cone satisfactory			
AGRD & VRS Part 3 AGRD & VRS Part 4A	RDG Part 2, Sect. 4.7	Check truck stopping distance			
AGRD & VRS Part 3	RDG Part 2, Sect. 6.5	Truck clearance time for crossing the intersection			
		Visibility of:			
		Islands (constructed and painted)			
AGRD & VRS Part 3-9		Auxiliary lane treatments			
		Lane diverge treatments			
		Lane merge treatments			
AGRD & VRS Part 3-8	RDG Part 2, Sect. 6.4	Clearances to services above ground and underground:			
		Gas mains			
		Electricity lines			
		Telephone lines, pits			
		Water mains			
		Sewage mains			
		Drainage pipes, pits			
		Oil pipelines			
AGRD & VRS Part 3-8.2, 3-10	RDG Part 2, Sect. 6.4	Clearance to structures			
		Bridge abutments			
		Building verandas			
AGRD & VRS Part 4 & 4A	Aust Part 5, Sect. 5	Island details and layout:			
		Meets minimum size			
		Size appropriate for storage of pedestrian signals and signs, pits			
		Approach nose radii			
		Departure nose radii			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Island provides appropriate driver direction			
		Shape discourages way movement			
		Traffic lane offset clearances			
AGRD & VRS Part 4A-4	Aust Part 5, Sect. 5	Auxiliary lane treatments:			
		Approach to treatment vehicle to driver			
		Island nose shape appropriate for design vehicle turns			
		Turning templates for turns been checked			
Austrroads Turning Templates	Austrroads Turning Templates	Turning movement for design vehicles provide for clearances:			
		Pedestrian standing areas			
		Sign locations			
		Traffic signal locations			
		Other intersection geometry checks			

Legend:

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Appendix VB.5: Drainage – Design Aid (from RDG Part 10, Appendix 4 – B3)

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Drainage control checks			
Task brief Contract Review	Task brief Contract Review	Drainage strategy			
Task brief Contract Review	Task brief Contract Review RDG Part 7, Sect. 7.1	Legal considerations			
Task brief Contract Review	Task brief Contract Review	Drainage authority requirements			
		Council			
		Melbourne water			
		Planning authorities			
		Developers			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-2	Task brief Contract Review RDG Part 7, Sect. 7.2	Plans cover the entire catchment area and surface features relevant to drainage			
Task brief Contract Review	Task brief Contract Review	Drainage reserves			
Task brief Contract Review	Task brief Contract Review	Adjacent property use			
AGRD & VRS Part 5 RDG Part 7-2, 7-4, 7-7	RDG Part 7, Sect. 7.2, 7.4, 7.7	Overland flow paths			
Task brief Contract Review	Task brief Contract Review	Environmental sensitive areas such as:			
AGRD & VRS Part 5 RDG Part 7-6	RDG Part 7, Sect. 7.6	Erosion controls			
		Vegetation area			
Task brief Contract Review	Task brief Contract Review	Geological report			
		Ground water table level			
		Stratum layers			
Task brief Contract Review	Task brief Contract Review	Service location, size and depth of:			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
	RDN No. 7.1	Electricity, water, sewage, gas, telephone			
Task brief Contract Review AGRD & VRS Part 3-8	Task brief Contract Review RDG Part 2, Sect. 6.4	Clearance to services			
Task brief Contract Review	Task brief Contract Review	Location of outfalls and responsible authority			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-1, 7-4	Task brief Contract Review RDG Part 7, Sect. 7.1, 7.4	Area affected by floods and flood levels			
Task brief Contract Review	Task brief Contract Review	Details on the existing drainage system:			
AGRD & VRS Part 5	RDG Part 7, Sect. 7.3, 7.4	Design discharge			
		Pipe sizes			
		Time of concentration			
		Average recurrence interval			
		Minimum pipe grading			
	Contract review site inspection notes	Drainage site inspection constraints/controls			
Task brief Contract Review	Task brief Contract Review	Design criteria			
AGRD & VRS Part 5 RDG Part 7-3, 7-4	RDG Part 7, Sect. 7.3, 7.4 RDN No. 74	Average recurrence interval for the design and hydraulic gradeline check			
		Coefficient of runoff for design and hydraulic gradeline check			
		Flow width			
		Freeboard requirements			
		Minimum and maximum			
		Pipe sizes			
		Pipe grading			
		Water velocities			
Task brief Contract Review AGRD & VRS Part 6A	Task brief Contract Review Aust Part 13, 14	Cyclist and pedestrian requirements			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
Task brief Contract Review	Task brief Contract Review	Bridge design responsibilities			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-3	Task brief Contract Review RDG Part 7, Sect. 7.3	Construction staging			
Task brief Contract Review	Task brief Contract Review	Other drainage controls			
		General drainage checks			
Task brief Contract Review	Task brief Contract Review	The grading of the road with respect to:			
AGRD & VRS Part 5 RDG Part 7-3, 7-4, 7-7	RDG Part 7, Sect. 7.3, 7.4, 7.7	Flood levels			
		Ground water levels			
		The flow across superelevation development			
		Acceptable flow width			
		Acceptable flow velocity			
		Outlet conditions			
		Subsurface drainage requirements			
		Landlocked sags			
Task brief Contract Review	Task brief Contract Review	Drainage diversions such as:			
AGRD & VRS Part 5 RDG Part 7-6	RDG Part 7, Sect. 7.6	Table drains			
		Catch drains			
		Noise attenuation mounds			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-1, 7-4	Task brief Contract Review RDG Part 7, Section 7.1, 7.4	Strategic assessment of the contributing catchment and construction requirements			
Task brief Contract Review	Task brief Contract Review	Does the strategic location address:			
AGRD & VRS Part 5 RDG Part 7-1, 7-4	RDG Part 7, Sect. 7.1, 7.4	Maintenance and construction Requirements			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Network drainage checks			
AGRD & VRS Part 5 RDG Part 7-4, 7-6, 7-7	RDG Part 7, Sect. 7.4, 7.6, 7.7	Appropriate pits types are provided at all low points in the:			
	RDN No. 44	Roadway			
		Median			
		Catch drains			
		Table drains			
		On the low side of superelevation in accordance with guidelines			
		Pit locations are not in conflict with:			
		Driveways			
		Pram crossings			
		Services			
AGRD & VRS Part 5 RDG Part 7-7	RDG Part 7, Sect. 7.7	Pavement surface flow widths are in accordance with the design criteria guidelines			
		Selection of the pipe network adopted is:			
		Visually cost efficient			
		Constructible			
		Road crossings are minimum			
AGRD & VRS Part 5 RDG Part 7-4	RDG Part 7, Sect. 7.4	Check pipe calculation components:			
		Area calculations including partial area affect			
		Discharge calculation			
		Grading			
		Size			
		Water velocity			
		Cover/clearances, e.g. Road, services			
		Settlement criteria			
		Ground water table level			
		SSDs outlet levels			
AGRD & VRS Part 5 RDG Part 7- 4.9	RDG Part 7, Sect. 7.4.9	Check data used in hydraulic gradelines calculations			
AGRD & VRS Part 5 RDG Part 7- 4.9	RDG Part 7, Sect. 7.4.9	Check hydraulic gradeline on drainage longitudinal plot			
AGRD & VRS Part 5 RDG Part 7-3, 7-4.7	RDG Part 7, Sect. 7.3, 7.4.7	For each segment of pipe: Calculation for:			
		50 year Q			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
		Pipe roughness			
		Reynolds No.			
		Selection of appropriate case A, B, C, or D			
		Estimation of pipe friction losses			
		Fiction factor "f" from moody diagram			
		For each segment of pipe:			
		Level of the hydraulic gradeline in the downstream end of pipe			
		Water level in the upstream pit			
AGRD & VRS Part 5 RDG Part 7-4.1.3	RDG Part 7, Sect. 7.4.1.3	Provision for major storms			
AGRD & VRS Part 5 RDG Part 7-6	RDG Part 7, Sect. 7.6	Outfall protection treatment:			
		Beaching			
		Grading			
		Litter and debris traps			
		Detention storage			
		Culvert design checks			
AGRD & VRS Part 5 RDG Part 7-3	RDG Part 7, Sect. 7.3	Culvert shape suits natural waterways			
AGRD & VRS Part 5 RDG Part 7-3	RDG Part 7, Sect. 7.3	Check culvert calculation components			
		Area calculations including partial area affect			
		Ground water table level			
		Discharge calculation			
		Grading			
		Size			
		Determination of			
		Allowable headwater			
		Tailwater			
		Critical depth flow			
		Outlet velocity			
		Drawdown affect			
		Application of inlet and outlet control nomography			
		Cover/clearances, e.g. Road, services			
		Settlement criteria			
Task brief Contract Review	Task brief Contract Review	Beaching requirements			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 5 RDG Part 7-6	RDG Part 7, Sect. 7.6 RDN No. 2	Energy dissipater requirements			
		Catch and table drain checks			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-6	Task brief Contract Review RDG Part 7, Sect. 7.6	Catch drain and table drain checks:			
		Level of the water compared to the top of bank			
		Level of water compared to the subgrade level of the road			
		Flow velocity values to prevent scouring			
		Level of water compared to the ssdp outlets			
		Debris control measures			
		Sub surface drainage checks			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7-5	Task brief Contract Review RDG Part 7, Sect. 7.5	Pavement depth compared to ssdp drain depth			
		Formation drain depth compared to ssdp drain depth			
		Cut and fill transition locations			
		Ground water levels			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7- 5.2	Task brief Contract review RDG Part 7, Sect. 7.5.2	The relative permeability of the pavement materials and the surrounding materials			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7- 5.2	Task brief Contract Review RDG Part 7, Sect. 7.5.2	Use of impervious collector pipes from subsurface drains			
Task brief Contract Review AGRD & VRS Part 5 RDG Part 7- 5.2	Task brief Contract Review RDG Part 7, Sect. 7.5.2	Sub surface pipe grading			

New AGRD/VRS Reference	Old Reference	Checklist Item	Design Date	Check Date	Comments
AGRD & VRS Part 5 RDG Part 7-5	RDG Part 7, Sect. 7.5	SSDs provide for:			
		Flat pavement			
		Cut/fill lines			
		Pavement widening trenches			
		End of structures			
AGRD & VRS Part 5 RDG Part 7-5	RDG Part 7, Sect. 7.5	Sub surface inlet and outlet			
		Spacing			
		Preliminary levels			
		Drainage pit levels			
		Table drain levels			
		Location			
		Quality extraction			
Task brief Contract Review	Task brief Contract Review	Quantity and costs:			
		Pits			
		Special pits			
		Pipe length			
Task brief Contract Review	Task brief Contract review	Other drainage checks			

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