Appendix B: Example Design Review Report

Design Review Report

Project Title: Unnamed Highway – 100 to 120 SLK

Project Details

MRWA Project Manager:	Joe Brown							
Designer:	AAA Consultants							
Items Submitted for Review:	Drawings numbered 201831-0038 to 0260 & Design Report							
Background Info Provided:	File 3-XYZ containing Project Charter, Concept Report & Correspondence							
Project Manager's File:	Not known							
Extent of Review:	All aspects defined on the drawings							
Status of Project:	15%	15% Close Out	85%	85% Close Out	100%	100% Close Out	IFC	IFC Close Out
Date Delivered to Reviewer:	15/02/2018							

Review Details

Reviewers:	Fred Smith (FS) & Tom Brown (TB)							
Company:	Main Roads WA – Road and Traffic Engineering Branch							
Review Reference Number:	R 982/18							
Reviewer's File:	18/44451							
Date of Review Completion:	01/03/2018							

Aspects Considered:	☒ Geometry	☐ Road Safety Barriers and Fencing	☒ Drainage	☐ Signs and Pavement Marking
Design Objectives:	☒ Safety	☒ Economy	☒ Efficiency & Effectiveness	☒ Environmental Sensitivity

Instructions for the Design Review Process

The *Reviewer* supplies **advice only** to the *Project Manager*. This review shall be conducted in accordance with MRWA Design Review Guideline (Doc. No. D16#287778). The *Project Manager* takes all risk and responsibility for each item beyond the *Designer's* "Duty of Care" when they close out the items.

1. Main Roads WA - Road and Traffic Engineering Branch is to review the drawings/documents and provide "Reviewer Comments" in column 5 of the Design Review Table.
2. The *Project Manager* is to assess the "Reviewer Comments" and accept/reject each one. The PM can add comments in column 8 of the Design Review Table and may close out the items.
3. The *Project Manager* is to forward the remaining relevant "Reviewer Comments" to the *Designer* for the *Designer* to provide responses in column 6 of the Design Review Table.
4. The *Designer* is to forward the responses to enable close out of each of the "Reviewer Comments" to the *Project Manager*. The *Project Manager* can close out the "Designer response" at this stage in column 8.
5. The *Project Manager* is to forward the remaining (not closed out) "*Designer* Responses" to the *Reviewer* for reassessment/advice. The *Reviewer* is to reply in column 5 (refer to the colour convention) of the Design Review Table for a second or third round of comment/responses or complete the "Response Status" in column 7.
6. The *Project Manager* is to determine the final outcome of all review items and add close out comments in column 8 of the Design Review Table.
7. The *Project Manager* is to forward final outcome/close out to all "Reviewer Comments" to:

The *Designer* for design/amendments to proceed.

Road and Traffic Engineering for record keeping.

8. To ensure that all review comments are acted on, a single review table should be used for all phases of the design review process.

______________________________ ________________

Project Manager Date

This design review is not to be considered a comprehensive design verification and may not pick-up all the issues. It therefore is not an approval of the presented design. The consultant/designer has the duty of care to ensure that the design is compliant with all the Standards and Guidelines and conforms to the requirements and intent of the design brief and agreed amendments.

Notes:

1 Other draft final drawings for this project were reviewed by Road & Traffic Engineering Branch and a report produced on 8 January 2018.

2 It was not possible to assess the placement of gullies because contour plans were not provided.

3 Minor drafting errors and omissions were not raised as findings because it was anticipated that they would be picked up during the designer's internal reviews.

4 The drawing and design of the "Standard Trash Rack" on 201831-0192 was not reviewed because Water Corporation owns this. They should be contacted if required to determine whether it conforms to their current practice.

Design Review Table

Importance	**Comments & Responses**	**Response Status**
1 *Critical issue. Fatal flaw.* **2** *Moderate importance. Non-compliance.* **3** *Observation only. Minor issue.*	*For second round of comment/response use* ***red*** *text with initials & date.* *For third round use* ***green*** *text with initials & date.*	**Accepted** *If resolved* **Noted** *If designer to take responsibility* **Pending** *If necessary to see the next submission* **PM Directive** *If PM is to decide the course of action and close out*

Column 1 **Item No.**	Column 2 **Reviewer Initials**	Column 3 **Reference**	Column 4 **Importance** *Reviewer*	Column 5 **Reviewer Comments** *Reviewer*	Column 6 **Designer Response** *Designer*	Column 7 **Response Status** *Reviewer* *(Initial & Date)*	Column 8 **Close Out** *Project Manager* *(Initial & Date)*
15% Design							
General							
1	N/A	ROSMA Road Safety Management Systems POLICY	1	Has the ROSMA Road Trauma Reduction Process been applied to this project? **This response should be provided by the Main Roads Project Manager.**			
2	N/A	General	1	Has the project scope been reviewed by Road Planning Branch to verify alignment with future planning requirements? **This response should be provided by the Main Roads Project Manager.**			
Geometry							
3	TB	General	3	SLKs should be shown in the title blocks of all drawings.			
4	TB	General	3	Batter slopes overlap in a number of locations.			
5	TB	General	3	Not all carriageway edges have been shown on the profile drawings.			
6	TB	General	3	A number of north points are misaligned. They should be checked on all drawings.			
7	TB	201831-0038	3	The index sheet needs to be broken up into categories to make it easier to use.			

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8	TB	200031-0040	3	The dimensions between the kerbs on the cross section of Ramp M501 do not add up.			
9	TB	200031-0040	3	The relative scales (horizontal to vertical) are inconsistent.			
10	TB	200031-0040	3	The indicative locations of the pavement boxes do not line up with the string lines in some cases.			
11	TB	200031-0040	2	The pavement detail is not completely clear about what is included in the current contract.			
12	TB	201831-0045 to 201831-0068	2	A number of "K" values shown on the drawings are incorrect.			
13	TB	201831-0045 to 201831-0068	3	Title blocks do not indicate whether the carriageways are Eastbound or Westbound.			
14	TB	201831-0045 to 201831-0068	3	Batters to retaining walls are not shown.			
15	TB	201831-0047	3	The profile strings are incorrectly labelled.			
16	TB	201831-0055	3	Noise wall is incorrectly labelled.			
17	TB	201831-0071	2	An approach offset to the median nose is required at the start and finish of the project in accordance with Austroads Guide to Road Design: Part 4A. Section 6.1.1.			
18	TB	201831-0071	2	Cycle lane should be 2m wide through intersections and throughout the project.			
19	TB	201831-0071 to 201831-0075	3	Where intersections are close together consideration should be given to maintaining the same pavement type between intersections. I.e. where less than 100m of highway pavement type is required.			
20	TB	201831-0071 to 201831-0075	2	Merge and diverge tapers in accordance with Austroads Guide to Road Design: Part 3. Table 9.8 should be provided at both ties to existing carriageway.			
21	TB	201831-0071 to 201831-0075	3	Check turning templates for Existing side Road intersection.			
22	TB	201831-0073	3	Existing cross Road- If possible median nose M5M1 should be moved forward to improve the turning movements for vehicles smaller than semi-trailers.			
23	TB	201831-0082	2	Modify profile of ramp M4WX to remove kink caused by development of superelevation between cha 150 and cha 210.			

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24	TB	201831-0086	2	For ramp M301. Superelevation of 340m radius curve should be 6% for 80kph. Show ramp dimensions on drawing. Correct north point. Remove excess edge lines to ramp nose.			
25	TB	201831-0087	2	For ramp M30X. Remove kinks from profile at cha 13900 and cha 13997.622. Show ramp width dimensions. Title block should reflect previous sheet.			
26	TB	201831-0104	3	For ramps M101 & M1MX. Label ramp M1MX on plan. Show other edges and superelevation details on ramp M101. Can ultimate earthworks be completed to suit ramp M101?			
27	TB	201831-0112 to 201831-0145	3	Some cross sections have unnecessary lines. For example Chainage 20 on Drawing 201831-0112.			
28	TB	201831-0112 to 201831-0145	3	Some cross sections do not re-join the natural surface. For example Chainage 60 on Drawing 201831-0118.			
29	TB	201831-0112 to 201831-0145	3	Some cut batters on the cross sections require that a shallow excavation is taken from an existing cut batter meaning that all vegetation will have to be cleared. For example Chainage 300 on Drawing 201831-00142. Slight steepening of the batter slope some distance away from the drain will reduce the extent of clearing.			
30	TB	201831-0148	2	PSP grades should be reduced if possible or flat sections provided for disabled users.			
31	TB	201831-0149	2	Profile at start of PSP should be adjusted to reduce grade. Horizontal radii should be increased. Refer Austroads Guide to Road Design: Part 6A. Table 5.6.			
32	TB	201831-0151	2	Alignment of PSP appears to run into batters of sump. DUP should be redesigned to meet required standards. Austroads Guide to Road Design: Part 6A.			
33	TB	201831-0153	2	Redesign PSP profile to achieve maximum grades of 3%.			
34	TB	201831-0162	3	Widths for payment are not shown.			
35	TB	201831-0162	2	The ramp cross section shows the pavement extending only 300 mm behind the face of the kerb rather than the normal 500 mm.			
Drainage							

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36	FS	General	2	Calculations have not been provided to verify that the proposed gully locations meet the standards.			
37	FS	General	3	The drawings are presented very poorly and are difficult to interpret. They should be drawn in accordance with Main Roads Design Presentation Guidelines available on our website.			
38	FS	General	3	A number of existing pipes have been given the note "ABANDON EXISTING DRAINAGE". The treatment of these redundant items needs to be more clearly specified on the drawings. All pipes and structures not required for drainage must be removed or filled with concrete slurry.			
39	FS	General	2	Further to the above, the method of identifying redundant pipes and structures is unclear. All pipes and structures that are no longer required should be marked with a stipple to accurately define the extent to be removed.			
40	FS	General	2	All low points on Unnamed Highway must have a secondary gully no greater than 50 mm above the low point gully to avoid flooding if the low point gully is blocked.			
41	FS	General	2	Quite a few structures have been specified with the incorrect pit-type. The types should conform to our drainage structure selection guide shown on standard drawing 200231-0084. For example: ▪ TEN pits should be no greater than 1200 mm deep ▪ Manholes do not need to be trafficable if they are well off the road Structures greater than 3600 mm deep must be D-type			
42	FS	General	3	For pipes running across two drawings, the pipe design details box should appear on only one of the drawings and a specific reference to the drawing giving the pipe details on the other.			
43	FS	General	2	All Structures that do not completely drain (e.g. bubble up pits and nearby structures) should be made 500 mm deeper and be given a perforated base.			
44	FS	General	3	Drainage design standards should be shown on the drawings for future reference.			

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45	FS	General	3	Pipes running along curved edges should also be installed on a curve to give a consistent construction cross-section and stay out of the pavement (where applicable).			
46	FS	General	2	Drainage for paths is required but has not been defined.			
47	FS	General	2	No drainage infrastructure appears to have been specified for runoff from the natural surface or to cater for the 100-year major storm event. What are the flow paths for this major event?			
48	FS	General	2	The drainage system must be sized and located to accommodate the ultimately planned layout with a minimum of sacrificial sections. Has this been done? A plan showing the ultimate concept should be provided with the drainage calculations.			
49	FS	General	3	All structures should be located (or relocated) off the road to simplify maintenance.			
50	FS	201831-0173	2	Structure 7B has been located in the roadway.			
51	FS	201831-0173	2	It may be possible to eliminate structure 17 by running the pipe from structures 13 to 18 through structure 14 instead.			
52	FS	201831-0173	3	It is expected that structure 15 will allow some bypass flows for heavy storm events. What will be the approximate recurrence interval of runoff bypassing structure 15? I would expect that scour protection is required adjacent to this high embankment.			
53	FS	201831-0174	3	The invert of the pipe leaving structure 27 appears to be wrong.			

Reviewers

Signed _____ Date _____